



September 5, 2004

Ms. Treva J. Knasel
Application Manager
Division of Mineral Resources Management
1855 Fountain Square Court
Columbus OH 43224

Dear Treva:

Enclosed are three copies of ARP R-0360-56 as requested. If you have any questions, please contact me.

Sincerely,
THE OHIO VALLEY COAL COMPANY

David L. Bartsch, P.E.
Environmental Coordinator and
Permit Administrator

cc: File

56854 PLEASANT RIDGE ROAD • ALLEDONIA OHIO 43902
(740) 926-1351 • FAX (740) 926-1615

TOVCC 19759

**OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION****APPLICATION TO REVISE A COAL MINING PERMIT**

Note: Refer to the Division's "General Guideline for Processing ARPs" and "Requirements for Specific Types of Common ARPs" for guidance on submitting and processing ARPs.

1. Applicant's Name THE OHIO VALLEY COAL COMPANY
Address 56854 PLEASANT RIDGE ROAD
City ALLEDONIA State Ohio Zip 43902
Telephone Number 740 - 926 - 1351
2. Permit Number D-0360

3. Section of mining and reclamation plan to be revised:

PART 3, PAGE 23, ITEM A(14)(a)

4. Describe in detail the proposed revision and submit any necessary drawings, plans, maps, etc.:

THIS REVISION INCLUDES CHANGES TO THE REFUSE DISPOSAL PLAN -
RAISING NO. 2 SLURRY IMPOUNDMENT. SEE ADDENDUM TO ITEM 4

5. Describe in detail the reason for requesting the revision:

THIS REVISION INCLUDES PHC AND STREAM BUFFER ZONE VARIANCE
REQUEST - SEE ADDENDUM TO ITEM 4

6. Will this revision constitute a significant alternation from the mining and reclamation operation contemplated in the original permit? Yes, X No.
(Note: refer to paragraph (E) (2) of 1501:13-04-06 of the Ohio Administrative Code to determine if a revision is deemed significant.)

If "yes," complete the following items 7 through 9.

7. In the space below give the name and address of the newspaper in which the public notice is to be published.

N/A

8. In the space below give the text of the public notice that is to be published. (Include the information required by paragraph (A)(1) of 1501:13-05-01 of the Ohio Administrative Code.)

N/A

9. In the space below give the name and address of the public office where this application is to be filed for public viewing.

N/A

I, the undersigned, a responsible official of the applicant, do hereby verify the information contained in this revision request is true and correct to the best of my information and belief.

DAVID L. BARTSCH

Print Name

David L. Bartsch

Signature

7-14-03

Date

Env. Coord.

Title

Sworn before me and subscribed in my presence this 14th day of July, 20 02

Penny J. Elliott

Notary Public



PENNY J. ELLIOTT, Notary Public
For The State of Ohio
Commission Expires February 11, 2008
Recorded in Monroe County

FOR DIVISION USE ONLY

This request is hereby _____

Chief, Division of Mines and Reclamation

Date

ARP TO RAISE NO. 2 SLURRY IMPOUNDMENT

Since 1975, the No. 2 Slurry Impoundment has served as the disposal facility for the fine refuse from the mine. This impoundment is reaching the end of its life and another facility is under design. However, to assure that the operation continues without interruption during the remainder of the design and permitting phases prior to operation of the new impoundment, it will be necessary to raise the No. 2 Impoundment another 10 ft.

Currently, the embankment has a crest elevation of 1125 ft and the water level is at elevation 1119.5 ft. The ultimate crest elevation currently is planned to be 1130 ft with maximum normal pool elevation 1120 ft. Under the design storm conditions (Probable Maximum Flood - PMF) the pool is designed to rise to elevation 1127 ft.

This proposal is to raise the embankment to elevation 1140 ft and the maximum normal pool to elevation 1130 ft. Under the design storm conditions the pool is designed to rise to elevation 1137 ft.

The ARP map shows the current pool elevation, the current maximum normal pool elevation, and the proposed normal pool elevation. This revision will allow another 2 ½ years of slurry disposal at the No. 2 Impoundment.

PROBABLE HYDROLOGIC CONSEQUENCES

The Probable Hydrologic Consequences (PHC) for the Powhatan No. 6 Mine originally were described in Addendum No. 9 (Addendum to Part 2, Item E) (copy enclosed). Since the time that the original PHC was written in 1984, 19 years have elapsed. The original PHC predicted the following consequences:

1. A reduction in rate of surface runoff to Captina Creek and tributaries due to collection and retention in ponds and impoundments;
2. Local increases in runoff (both rate and quantity) due to barren and impervious surfaces associated with mine operations;
3. Local increases in infiltration to shallow aquifers due to seepage from ponds and impoundments, and increased infiltration resulting from reduced vegetative cover;
4. Increased base flows in Captina Creek and tributaries resulting from increased infiltration identified in item 3 above;
5. No significant net change in water quantity within or near the permit area because there

ADDENDUM TO ARP ITEM 4
THE OHIO VALLEY COAL COMPANY
PERMIT D-0360
PAGE 2

are no identified significant additions to or withdrawals from the hydrologic system; and

6. No significant changes in water quality within and near the permit area since sediment controls and water treatment are operated in accordance with regulation requirements.

In the time period since this PHC was written, Ohio Valley has had the opportunity to evaluate the predicted consequences. Those evaluations show:

1. While instantaneous changes in the rate of surface runoff may occur, the overall result is that no net change occurs as the ponds discharge the runoff in a more controlled manner.
2. The ponds help to buffer the increases in runoff due to barren and impervious surfaces. Water treatment maintains good water quality when needed.
3. Local increases in infiltration have not been documented as the ponds have clay liners that impede infiltration.
4. Increased base flows in Captina Creek have not been documented.
5. There has been no net change in water quality as predicted.
6. The treatment facilities at the No. 6 Mine have maintained the water quality in accordance with regulation requirements. In fact, since the mine was installed in 1972, Captina Creek has earned a designation of Exceptional Warm Water Habitat, the highest designation for a stream in Ohio. In fact, one endangered species was found to exist downstream of the No. 6 Mine (Eastern Hellbender) attesting to the fact that the water quality is not degraded.

In 1999, the adjacent coarse refuse pile was completed and a new coarse refuse pile was located immediately downstream of the No. 2 Slurry embankment. The placement of this coarse refuse serves to buttress the embankment. All runoff from this new pile is directed into a sediment pond (Pond 13) and soon will be directed into a second sediment pond (Pond 14). In addition, all seepage (approximately 40 gallons per minute) from this pile is directed to pond 13.

As the pile is raised, the face is topsoiled and seeded, removing additional sediment load from the pond and keeping levels of iron and manganese low. The new site has an underdrain system, a clay liner, and a leachate collection system located under the refuse and above the clay liner. Quarterly monitoring shows that there is no degradation of groundwater occurring. Quarterly monitoring of the streams show that there is no degradation of the surface water. This monitoring is expected to continue throughout the life of this permit. Seasonal variations in water quality may be seen in elevated levels of some metals. This variation is due to dilution caused by increased runoff. Quarterly monitoring reports are enclosed.

The PHC for the new coarse refuse pile (Approved application D-0360-8. Design Plans, Section 7.3) (copy enclosed) indicates the following:

"The proposed facility has the potential to produce acid drainage as well as high concentrations of suspended and dissolved solids, and metals such as iron and manganese. The construction, operation, maintenance, water monitoring and reclamation proposed are designed to mitigate or eliminate these effects. Consequently, there are no significant adverse impacts on the surface water, groundwater regime, or hydrologic balance either on or off the site." Since the beginning of the facility until now, suspended solids, dissolved solids, and iron and manganese have been controlled through the maintenance of treatment and sediment controls. To date, Soda Ash (pH, iron and manganese control) and gel logs (suspended solids and iron) have been used to treat the water in Pond 13. The pond and the sump leading to it are cleaned several times a year to maintain the structures and to stay in compliance.

The proposed revision to raise the No. 2 Slurry Impoundment will have a no additional effect to the hydrology of the area. The probable hydrologic consequences of this proposal are:

1. Temporary reduction in rate of surface runoff to Captina Creek and tributaries due to collection and retention in ponds and impoundments. However, this reduction is offset by controlled introduction of the water in the ponds after sediment and other pollutants are removed due to treatment and retention time.
2. Local increases in runoff (both rate and quantity) due to barren and impervious surfaces associated with mine operations. However, this increased flow is intercepted by the drainage control structures (ponds and impoundments) as described in item 1 above.
3. No significant net change in water quantity or quality. Treatment facilities are operated in accordance with regulation requirements.

CONSTRUCTION

The construction required to raise the No. 2 Slurry Impoundment 10 ft involves the same placement and compaction of coarse mine refuse in 12-in. lifts. Compaction of 95 percent of standard proctor is required for this construction. In order to limit seepage through the embankment, the new construction is to have a minimum width of 100 ft at the highest point. The cutoff trenches will need to be extended another 10 ft vertically. The emergency spillway was excavated and a control sill was installed at elevation 1122.5 ft. A concrete wall will be needed to handle the design storm. This structure will be an inverted "t" shape. The engineering analysis for this structure is enclosed. This report was submitted for review to MSHA and Ohio Division of Water, Water Management Section.

PART 3, PAGE 24, ITEM D(5)

All topsoil material will be removed from the area to be affected by the proposed maximum water level.

STREAM BUFFER ZONE VARIANCE REQUEST

In October 1980, a stream buffer zone variance request (copy enclosed) was approved for this drainage (Perkins Run) (copy enclosed). The approval was given with two conditions:

1. The waterway(s) shall be separated from the disturbed area by a dike or diversion that will direct surface drainage through a treatment system prior to entering the waterway(s).
2. Areas between waterway(s) and dike or diversion must be protected from erosion and kept free of all acid or toxic-forming materials.

These conditions will continue to be met.

Per PPD Permitting and Hydrology 98-1, see attached updated B.Z.V.R. addressing additional impacts to all streams (as indicated by the June 30, 2003 Army Corp of Engineers letter).

OHIO EPA AND US ARMY CORP OF ENGINEERS CONCURRENCE

Both the Ohio EPA and the US Army Corp of Engineers have sent letters verifying that this work can be authorized under the Nationwide 21 Permit. Copies of their letters are enclosed. A Nationwide 21 Permit application has been submitted to the US Army Corp of Engineers.

MSHA AND DIVISION OF WATER CONCURRENCE

Both the Mine Safety and Health Administration and the Ohio Division of Water (Water Management Section) have been consulted with the plans for the vertical expansion of the embankment.

NO. 2 SLURRY DAM
ENGINEER REVIEW RESPONSES

The design of the embankment for No. 2 dam was submitted to the Division in an ARP when the dam was modified several years ago (*Final Design Report, Modifications to Slurry Dam No. 2* dated February 1990 by DLZ Corporation – formerly Mason-Deverteuil Geotechnical Services).

1. The anticipated additional storage volume from EL 1120 to EL 1130 is 1634 acre-ft. The volume at elevation 1120 was calculated and is available in the. This design report was submitted to the Division in an ARP when the dam was modified several years ago (see *Final Design Report*). The same engineer for raising No. 2 Dam calculated the volume at elevation 1130. The current rate of infilling is approximately 284 acre-ft per year from the Powhatan No. 6 Mine and approximately 335 acre-ft per year from the Century Mine for a total infilling rate of approximately 619 acre-ft per year. Therefore it is anticipated that the increase storage capacity will last for a minimum of 2.5 years, at which time the No. 3 slurry impoundment (currently being permitted) will be started.
2. The current embankment plans are anticipated to meet its maximum capacity during the late fall of 2004. With the proposed raised embankment the life expectancy is anticipated to last till the late spring or early summer of 2007.
3. The proposed embankment modifications of the No. 2 slurry dam will be an extension of the current slopes as outlined in the *Final Design Report, Modifications to Slurry Dam No. 2* dated February 1990. This design report was submitted to the Division in an ARP when the dam was modified several years ago (originally). The structural stability of these embankments is discussed within the design report, which also will be valid for the proposed embankment modifications.
4. The materials underlying the proposed embankment modifications have been placed at a minimum of 95% of the maximum dry density as determined by the standard proctor. Some settlement may occur over time as the materials consolidate. Testing performed on the coarse coal refuse material during the 1990 modification design indicated that a cohesion value ranged from 1500 to 2000 psf for material compacted to 95% of the maximum dry density. Based on these strength values a bearing capacity failure is not anticipated (see *Final Design Report*).
5. Seepage was addressed for the existing embankment in the *Final Design Report: Modifications to Slurry Dam No. 2* dated February 1990. This design report was

5. Address the seepage rate and elevation through the embankment given the proposed additional hydrostatic forces.

- ▶ **Seepage was addressed for the existing embankment in the *Final Design Report; Modifications to Slurry Dam No. 2* dated February 1990. These rates will be slightly higher with the additional hydrostatic forces that will result from the proposed modifications. However, Perkins Run is being utilized as a coarse coal refuse disposal area immediately downstream of the No. 2 Slurry Dam. Consequently, disposal fill is being placed against the downstream face resulting in an embankment section that is several hundred feet thick. Seepage exiting from the downstream fill will be negligible.**

6. Discuss the breakthrough potential of the slurry impoundment into the underground mines.

- ▶ **TOVCC / DAVE**

7. The narrative of the ARP implies that MSHA and DOW have approved the proposed condition, yet the approval letters are not attached. Revise.

This item was addressed in the last item on Page 4 of this addendum.

8. Discuss what portions of the approved permit for Perkins Run will need modified if the proposed condition is approved. Submit revisions for that facility as required.

- ▶ **TOVCC / DAVE**

9. DLZ recommends that the coarse coal in Perkins Run be kept at or above the elevation of the pool level. Address whether this will occur or not.

- ▶ **TOVCC / DAVE**

10. Is the emergency spillway lined to prevent erosion from the PMF event? Document.

- ▶ **The current emergency spillway has been excavated into bedrock that is resistant to erosion. The proposed spillway control sill will also be installed into the foundation bedrock of the existing spillway. Additionally, the proposed spillway control sill has an 8-foot long concrete splash plate that abuts against the existing concrete control sill. Therefore, any water that flows over the top of the proposed spillway control sill will impact against the concrete structure prior to flowing on top of the bedrock.**

11. Provide more detail on the extension of the decant structure. Provide size, slope, material types, inlet details, pool elevation control structures, etc. Discuss how the proposed will be joined to the existing structure.
 - ▶ **The decant structure will be extended from the existing structure upslope on the right abutment maintaining the existing 24% pipe slope. The extension will be the same size, shape, and design as the existing structure. The bottom and sides of the existing structure shall be chipped $\frac{1}{4}$ to $\frac{1}{2}$ -inch to create a roughened surface. The roughened surface shall be coated with a bonding agent before placing any new concrete. New concrete shall have a minimum compressive strength of 4000 psi at 28 days. The top of the decant shall consist of pre-cast reinforced concrete stop-logs that can be grouted in-place to control the pool elevation. For construction details refer to DLZ Plan Sheets 9 and 10 of the attached plans.**
12. Provide the details of the cut-off trenches for the abutments. Are they the same as the original design? If so, is the original design applicable?
 - ▶ **The cut-off trenches are the same as those outlined in the *Final Design Report, Modifications to Slurry Dam No. 2* dated February 1990. The cut-off trench extensions will be started within the existing cut-off trenches already installed within the existing embankment and placed into the ridgeline under the proposed embankment modification. The cut-off trenches will be extended into competent bedrock and backfilled with coarse coal refuse to at least 95% of the standard proctor value. The compacted coarse coal refuse will act to reduce seepage at the embankment/bedrock interface.**
13. Provide plan view of entire area where embankment will be added, including original and proposed toe and top of slopes. Include area of Perkins Run that will require expansion.
 - ▶ **A plan showing the proposed embankment modifications in relation to the Perkins Run disposal area is shown on DLZ Plan Sheet 4 attached. The impoundment area for the proposed modifications is shown on DLZ Plan Sheet 3 attached. For the location of the original toe and of slope locations please refer to the *Final Design Report, Modifications to Slurry Dam No. 2* dated February 1990.**
14. DLZ recommends a minimum width of 100' between the slurry and the outslope. Demonstrate how this will be accomplished.
 - ▶ **Which outslope is being referred to within the question, please clarify. DAVE???**

15. Discuss the backfill required around the cut-off wall to ensure seepage is minimized.
 - ▶ **A seepage blanket consisting of compacted coarse coal refuse will be placed upstream of the proposed spillway control sill. Coarse coal refuse will be placed in 8-inch loose lifts and compacted to 95% of the maximum dry density of the material. The fill will be placed to elevation 1130 and extend 60 feet upstream of the proposed spillway control sill. The proposed spillway control sill will extend into the spillway sidewalls and a key will be placed into the foundation bedrock. These features will be poured directly against the cut bedrock with waterstops placed at all joints to minimize seepage.**
16. What does the dimension of 15' on sheet 2 of the DLZ plans signify?
 - ▶ **This dimension was a typographical error and has been corrected. The corrected sheet is shown on DLZ Plan Sheet 5 attached.**
17. Provide slope stability analysis for the proposed condition. Include the geotechnical parameters used for each scenario analyzed. Include seismic analysis. Provide correlation between compaction effort of 95% Standard Proctor and the shear strength required for stability.
 - ▶ **The proposed embankment modifications of the No. 2 slurry dam will be an extension of the current slopes as outlined in the *Final Design Report, Modifications to Slurry Dam No. 2* dated February 1990. The slope stability of the embankment is discussed within the design report, which will be valid for the proposed embankment modifications.**
18. DLZ recommends monitoring the settlement of the embankment. How will this be accomplished?
 - ▶ **The embankment will be monitored during construction and post construction for settlement through the use of survey points across the embankment. These survey points will be referenced to control points established outside of the work limits in areas known to be stationary.**
19. Verify width of spillway control sill, sheet 3. This shows a bottom width of 90', yet plan view shows 50'.
 - ▶ **The spillway and the spillway control section are 50-foot in width. The spillway control sill is 90-foot in width so that the sides will extend into the spillway sidewalls to act as a key to reduce seepage around the ends of the wall.**

20. Discuss the geologic conditions of the area proposed to be inundated. Are there seeps, what are the material types, are there abandoned mines, etc.?
- ▶ **The geologic conditions of the No. 2 Slurry Dam and the impoundment area are discussed in detail in the *Final Design Report; Modifications to Slurry Dam No. 2* dated February 1990. Only minor seepage has been periodically noted within the inundation area, except along the right abutment. These areas along the right abutment are currently being addressed through seepage control measures that will be extended upslope as needed with the proposed embankment modifications. Underground mining has been performed within the area in the past. A description of these activities and the pillars sizing and discussed within the *Final Design Report, Modifications to Slurry Dam No. 2* dated February 1990.**
21. Is Pond 14 approved?
- ▶ **Yes.**
22. Demonstrate that sufficient clayey soil borrow and earthen material for capping is available on the permit.
- ▶ **Raising the water level at the No. 2 Dam to the 1130 foot surface elevation will create a pond area of 175.11 acres. Allowing for two-percent crown slopes in the reclamation plan, the estimated reclamation or re-soiled surface is approximately 177 acres. The required unit thickness and total volume of resoiling material in descending order of placement, is as follows: Vegetative cover soil, six inches thick, 88.5 acre-feet; Inert Earthen Fill, eighteen inches thick, 265.5 acre-feet, and Clay Cap, twenty-four inches thick, 354 acre-feet. This material will be sourced in two ways: First from the No. 2 Dam perimeter between the current pond elevation of 1118.7 feet to the requested pond elevation of 1130 feet, which is 13.22 acres; and Second, from the three borrow areas permitted adjacent to the No. 2 Dam impoundment, as shown on the approved D-0360-8 Permit Application and Hydrology Map. The borrow areas contain 129.4 acres which were permitted for the reclamation requirements of the No. 2 Dam. It is estimated that these combined areas contain 143 acre-feet of vegetative cover soil, 572 acre-feet of low permeability clay, and over 1100 acre-feet of inert earthen material, all of which will provide adequate cover and cap material for reclamation of the No. 2 Dam. Please refer to Appendix 5, Soils and Geotechnical Testing Data, in the Hydrogeologic Investigation Report for the Perkins Run Coarse Coal Refuse Disposal Facility, dated February, 2000.**

ADDENDUM TO PART 3, PAGE 27, ITEM G(5)
STREAM BUFFER ZONE VARIANCE REQUEST
THE OHIO VALLEY COAL COMPANY

Chief
Division of Mineral Resource Management
1855 Fountain Square Court, Bldg. H-2
Columbus, Ohio 43224-1383

Dear Chief,

The Ohio Valley Coal Company is hereby requesting a variance to conduct refuse disposal operations within the buffer zone of unnamed intermittent streams as shown on the permit application map and described below.

SPECIFIC ACTIVITIES:

Unnamed Stream "C"

Activities to be conducted within the 100 foot buffer zone of Stream "C" located within Permit D-0360 consists of raising the water elevation within the existing coal refuse disposal areas. All topsoil will be removed within this area of the buffer zone of this stream.

For purposes of this description, Stream "C" flows in a southwesterly direction. The stream channel will be disturbed and eliminated up to the 1130 elevation. One hundred one (101) feet of the Stream "C" channel will be affected by this activity.

Existing conditions in Stream "C" consists of a substrate of sand and bedrock of sandstone and shale origin. Silt cover is moderate with moderate embeddedness. Instream cover is generally sparse and consists of shallows and boulders. Channel morphology exhibits low sinuosity, poor development, no channelization, and high stability. Riparian width is none, with a forested floodplain and no bank erosion. Pool/glide and riffle/run quality have a maximum depth of less than 0.2 meters. Pool width is more than riffle width with slow velocity. Riffle/run substrate is stable with low embeddedness.

Stream "C" has been previously affected downstream by coal refuse disposal.

The duration of activities within the buffer zone of Stream "C" will be approximately 2.5 years. Disturbance of this buffer zone will begin upon approval of the A.R.P. that this BZVR is associated with.

Unnamed Stream "E"

Activities to be conducted within the 100 foot buffer zone of Stream "E" located within Permit D-0360 consists of raising the water elevation within the existing coal refuse disposal area. All topsoil will be removed within this area of the buffer zone of this stream.

For purposes of this description, Stream "E" flows in a southwesterly direction from head of hollow. The stream channel will be disturbed and eliminated up to the 1130 elevation. One hundred seventeen (117) feet of the Stream "E" channel will be affected by this activity.

Existing conditions in Stream "E" consists of a substrate of sand and bedrock of sandstone and shale origin. Silt

cover is moderate with moderate embeddedness. Instream cover is generally sparse and consists of shallows and boulders. Channel morphology exhibits low sinuosity, poor development, no channelization, and high stability. Riparian width is none, with a forested flood plain and no bank erosion. Pool/glide and riffle/run quality have a maximum depth of less than 0.2 meters. Pool width is more than riffle width with slow velocity. Riffle/run substrate is stable with low embeddedness.

Stream "E" has been affected downstream by coal refuse disposal.

The duration of activities within the buffer zone of Stream "E" will be approximately 2.5 years. Disturbance of this buffer zone will begin upon approval of the A.R.P. that this BZVR is associated with.

Unnamed Stream "F"

Activities to be conducted within the 100 foot buffer zone of Stream "F" located within Permit D-0360 consists of raising the water elevation within the existing coal refuse disposal area. All topsoil will be removed within this area of the buffer zone of this stream.

For purposes of this description, Stream "F" flows in a southeasterly direction from head of hollow. The stream channel will be disturbed and eliminated up to the 1130 elevation. One hundred eighteen (118) feet of the Stream "F" channel will be affected by this activity.

Existing conditions in Stream "F" consists of a substrate of sand and bedrock of sandstone and shale origin. Silt cover is moderate with moderate embeddedness. Instream cover is generally sparse and consists of shallows and boulders. Channel morphology exhibits low sinuosity, poor development, no channelization, and high stability. Riparian width is none, with a flood plain of forested pasture and no bank erosion. Pool/glide and riffle/run quality have a maximum depth of less than 0.2 meters. Pool width is more than riffle width with slow velocity. Riffle/run substrate is stable with low embeddedness.

Stream "F" has been affected downstream by coal refuse disposal.

The duration of activities within the buffer zone of Stream "F" will be approximately 2.5 years. Disturbance of this buffer zone will begin upon approval of the A.R.P. that this BZVR is associated with.

Unnamed Stream "H"

Activities to be conducted within the 100 foot buffer zone of Stream "H" located within Permit D-0360 consists of raising the water elevation within the existing coal refuse disposal area. All topsoil will be removed within this area of the buffer zone of this stream.

For purposes of this description, Stream "H" flows in a southeasterly direction from head of hollow. The stream channel will be disturbed and eliminated up to the 1130 elevation. Two hundred nine (209) feet of the Stream "H" channel will be affected by this activity.

Existing conditions in Stream "H" consists of a substrate of sand and bedrock of sandstone and shale origin. Silt cover is moderate with moderate embeddedness. Instream cover is generally sparse and consists of shallows and boulders. Channel morphology exhibits low sinuosity, poor development, no channelization, and high stability. Riparian width is none, with a flood plain of forested pasture and no bank erosion. Pool/glide and riffle/run quality have a maximum depth of less than 0.2 meters. Pool width is more than riffle width with slow velocity. Riffle/run substrate is stable with low embeddedness.

Stream "H" has been affected downstream by coal refuse disposal.

The duration of activities within the buffer zone of Stream "H" will be approximately 2.5 years. Disturbance of this buffer zone will begin upon approval of the A.R.P. that this BZVR is associated with.

Unnamed Stream "I"

Activities to be conducted within the 100 foot buffer zone of Stream "I" located within Permit D-0360 consists of raising the water elevation within the existing coal refuse disposal area. All topsoil will be removed within this area of the buffer zone of this stream.

For purposes of this description, Stream "I" flows in a southerly direction from head of hollow. The stream channel will be disturbed and eliminated up to the 1130 elevation. One hundred twenty nine (129) feet of the Stream "I" channel will be affected by this activity.

Existing conditions in Stream "I" consists of a substrate of sand and bedrock of sandstone and shale origin. Silt cover is moderate with moderate embeddedness. Instream cover is generally sparse and consists of shallows and boulders. Channel morphology exhibits low sinuosity, poor development, no channelization, and high stability. Riparian width is none, with a flood plain of forested pasture and no bank erosion. Pool/glide and riffle/run quality have a maximum depth of less than 0.2 meters. Pool width is more than riffle width with slow velocity. Riffle/run substrate is stable with low embeddedness.

Stream "I" has been affected downstream by coal refuse disposal.

The duration of activities within the buffer zone of Stream "I" will be approximately 2.5 years. Disturbance of this buffer zone will begin upon approval of the A.R.P. that this BZVR is associated with.

Unnamed Stream "J"

Activities to be conducted within the 100 foot buffer zone of Stream "J" located within Permit D-0360 consists of raising the water elevation within the existing coal refuse disposal area. All topsoil will be removed within this area of the buffer zone of this stream.

For purposes of this description, Stream "J" flows in a southeasterly direction from head of hollow. The stream channel will be disturbed and eliminated up to the 1130 elevation. Sixty-four (64) feet of the Stream "J" channel will be affected by this activity.

Existing conditions in Stream "J" consists of a substrate of sand and bedrock of sandstone and shale origin. Silt cover is moderate with moderate embeddedness. Instream cover is generally sparse and consists of shallows and boulders. Channel morphology exhibits low sinuosity, poor development, no channelization, and high stability. Riparian width is none, with a flood plain of forested pasture and no bank erosion. Pool/glide and riffle/run quality have a maximum depth of less than 0.2 meters. Pool width is more than riffle width with slow velocity. Riffle/run substrate is stable with low embeddedness.

Stream "J" has been affected downstream by coal refuse disposal.

The duration of activities within the buffer zone of Stream "J" will be approximately 2.5 years. Disturbance of this buffer zone will begin upon approval of the A.R.P. that this BZVR is associated with.

Identification of Ephemeral Stream Channels

There are six (6) ephemeral stream channels that will be affected by the proposed raising of the water level at the #2 Dam site. Each one has been considered in the June 30, 2003 letter from the Army Corp of Engineers. These ephemeral channels have been identified on the map and are described as follows:

Ephemeral channel E1 is located south of Unnamed Stream "H". An additional 41 feet of this channel will be affected by raising the water level at this site.

Ephemeral channel E2 is located south of Unnamed Stream "H". An additional 44 feet of this channel will be affected by raising the water level at this site.

Ephemeral channel E3 is located south of Unnamed Stream "F". An additional 55 feet of this channel will be affected by raising the water level at this site.

Ephemeral channel E4 is located in the first hollow southeast of Unnamed Stream "J". An additional 113 feet of this channel will be affected by raising the water level at this site.

Ephemeral channel E5 is located in the second hollow southeast of Unnamed Stream "J". An additional 68 feet of this channel will be affected by raising the water level at this site.

Ephemeral channel E6 is located in the third hollow southeast of Unnamed Stream "J". An additional 106 feet of this channel will be affected by raising the water level at this site.

All of these ephemeral channels are small hollow depressions that create flow only during periods of sustained rainfall. These ephemeral channels are being addressed in this B.Z.V.R. to clarify their respective lengths and location per the Army Corp of Engineers correspondence dated June 30, 2003 letter, and their required permitting under the Nationwide 21 permit. Streams in, and buffer zones of, the ephemeral channels are not required to be, and therefore are not being shown on the A.R.P. Application map.

NECESSITY FOR ACTIVITIES:

The existing #2 Dam refuse disposal area is nearly filled to currently approved capacity. Additional slurry refuse disposal area is necessary while permitting of a new area for this purpose is completed and approved by the appropriate regulatory agencies.

Other disposal sites were considered on areas owned by The Ohio Valley Coal Company remote from the existing disposal area. These sites were eliminated from consideration for several reasons. They would require haulage of refuse along township or county roads. This would create the potential for pollution of streams away from the permit as well as refuse dropping from the haulage vehicles onto the public roads. The construction of the disposal area would require an entirely new and separate system of pollution controls whereas the main pollution controls for the proposed site are in existence already.

WATER QUALITY/QUANTITY AND ENVIRONMENTAL RESOURCES:

Water quality in Unnamed Streams "C", "E", and "F" is generally fair. Acceptable levels of manganese, sulfates and iron are indicated by the six monthly samples at these locations. In six months sampling, average flows in stream "C" (U6-17) range from 0.02 cfs to 0.002 cfs. Average flows in stream "E" (U6-15) range from 0.09 cfs to 0.008 cfs. Average flows in stream "F" (U6-7) range from 0.03 cfs to 0.0003 cfs. (See approved permit D-0360-8 for sample

analyses)

Water quality in Unnamed Streams "H", "I", and "J" is generally fair. Acceptable levels of all parameters are indicated by the six monthly samples at these locations, with the exception of Stream "J" (U6-8) which shows elevated pH and iron levels during the March and April sampling analyses. In six months sampling, average flows in Stream "H" (U6-13A) range from .002 cfs to .1 cfs. Average flows in Stream "I" (U6-14) range from .003 cfs to .09 cfs. Average flows in Stream "J" (U6-8) range from .0006 cfs to .02 cfs. (See approved permit D-0360-8 for sample analyses)

Riparian vegetation within the stream channels consist of typical plant life, while the buffer zones are forested or forested pasture with shrubs, small trees and hardwoods.

There are numerous wooded areas and streams surrounding the site on land which is owned by The Ohio Valley Coal Company which will provide wildlife habitat and travel corridors until the site is reclaimed

All topsoil will be stripped from the proposed affected areas.

An Ohio E.P.A. 401 certification is not required at this site, per O.E.P.A. letter dated May 30, 2003. A Nationwide 21 permit has been submitted to the Army Corp of Engineers.

SEQUENCING OF OPERATIONS

The total life of this coal slurry refuse disposal facility extension is projected to be approximately 2.5 years. The sequence of proposed activities is as follows:

- 1) Topsoil removal and stock piling
- 2) Refuse placement

STREAM RECONSTRUCTION, DIVERSION OR RELOCATION:

No stream reconstructions or relocations are applicable for this project. All stream and buffer zone affects as well as sequencing of operations, are discussed in the previous sections of this document.

REVEGETATION:

Revegetation in the buffer zone areas described herein is not applicable due to the circumstances of the proposed A.R.P.

All work within the stream buffer zone will be performed in timely and workmanlike manner to prohibit as best as can be accomplished, detrimental affects upstream.

Sincerely,

THE OHIO VALLEY COAL COMPANY
 PERMIT D-0360
 ADDENDUM TO ARP TO RAISE NO. 2 SLURRY IMPOUNDMENT 10 FT

1. When raw coal is removed from the mine, it contains a certain amount of rock that must be removed. It is removed in a wet process by use of specific gravity. The rock that is removed is in one of two forms, coarse coal refuse and slurry. The coarse coal refuse is disposed in a refuse pile while the slurry is sent to a slurry pond. At the Powhatan No. 6 Mine, the coarse coal refuse also is used to build the main embankment for the slurry pond and the remainder is placed downstream to buttress (strengthen) it. The D-0360-8 application addressed the coarse coal refuse downstream of the main embankment. The proposal in this ARP is to provide additional storage capacity in the impoundment for slurry. The coarse coal refuse below No. 2 Dam always was projected to be raised to elevation 1150 ft. The only change is the compaction efforts of the refuse will increase as is standard for construction of the impoundment.
2. Table 1 is a compilation of the quarterly monitoring data from a typical year, 2002 for several QMR sampling locations, U6-1 (furthest upstream point) and D-1 (downstream point).

TABLE 1
 2002 QMR DATA

U6-1

ANALYTE	UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
FLOW	CFS	125.6	127	7.6	7.6
HARDNESS	MG/L	130	140	180	190
SULFATES	MG/L	46	41	70	96
SPECIFIC CONDUCTANCE	μMHO/CM AT 25° C	510	330	450	1100

D-1

ANALYTE	UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
FLOW	CFS	125.6	134.1	12.4	12.4
HARDNESS	MG/L	140	160	240	220
SULFATES	MG/L	66	75	730	220
SPECIFIC CONDUCTANCE	μMHO/CM AT 25° C	510	510	2200	1700

Table 2 is an analysis of the raw data presented in Table 1. It shows the relationship between flow and concentration by dividing the concentration of the analyte by the flow, denoted as the concentration per unit flow (CONC/UF), (flow is in cfs in this case).

TABLE 2
ANALYSIS OF 2002 MONITORING DATA

U6-1 QUARTER	HARDNESS CONC/UF	SULFATES CONC/UF	SPEC COND CONC/UF
1	1.04	0.37	4.06
2	1.10	0.32	2.60
3	23.68	9.21	59.21
4	25.00	12.63	144.74

D-1 QUARTER	HARDNESS CONC/UF	SULFATES CONC/UF	SPEC COND CONC/UF
1	1.11	0.52	4.03
2	1.19	0.56	3.80
3	19.35	58.87	177.42
4	17.74	17.74	137.10

This analysis clearly shows that as the flow decreases seasonally, the concentration increases by an average of 20.5:1 in the case of hardness, by an average of 75.5:1 for sulfates, and by an average of 51.5:1 for specific conductance. The prediction that seasonal variation in water quality may be seen as elevated levels of some constituents is accurate.

The April 15, 2002 analysis that shows high concentrations of some primary drinking water constituents appears to be an anomaly, as those concentrations did not persist. If there had been some contamination, one would expect the concentrations to be higher in the lower flow conditions, as predicted. This clearly was not the case.

May 4, 2004

The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Attn: Mr. David Bartsch, P.E.

Re: Seepage Analyses and Recommendations
Proposed 10-foot Raise
Slurry Dam No. 2

Mr. Bartsch:

We have completed the seepage analyses for the proposed No. 2 dam section and the Perkins Run Disposal area immediately downstream of the No. 2 embankment. A cross-section of the proposed No. 2 dam section and the disposal facility are attached. As can be seen in the cross-section, the disposal fill placement results in a section approximately 900 feet wide.

When the pool reaches elevation 1130, it is estimated that the seepage flow into the toe drains will be approximately 40 gallons per minute (gpm). The toe drain is large enough to transport this flow, with an adequate factor of safety.

In addition, we have analyzed the combined embankment and disposal refuse section to estimate the amount of seepage that would exit the downstream face of the disposal area. The seepage analysis was performed using the finite-element program FastSeep. The parameters assumed for the various fill materials are shown on the results of the analyses, which are also attached. The analysis also very conservatively assumed that the toe drains was not functioning.

The analysis indicated that the amount of seepage exiting the existing downstream face of the disposal area would be approximately 6 gallons per minute (gpm). This amount of flow is extremely small and unlikely to create a seepage or piping problem. Therefore, we don't believe piping will develop, even if the toe drain ceases to function over time.

Based on the results of the seepage analyses (attached) and the stability analyses (sent under separate cover), raising the pool to elevation 1130 should have no adverse impact on the embankment and the disposal area fill. The existing instrumentation at the project should continue to be monitored and any changes be brought to the attention of DLZ immediately. However, we don't believe that additional monitoring of the project is necessary.

We hope that this information is helpful. Please call if you have any questions.

Sincerely,

DLZ Ohio, Inc.

Arthur (Pete) Nix, P.E.

M:\proj\0321\3002.00\No 2 dam raising recommendataions ltr.doc

HYDROLOGIC DETERMINATION

Permit Area Hydrologic Impacts

The hydrologic impacts of Powhatan No. 6 can be described by drawing on information and data presented in Addendum Nos. 6, 7 and 8 and Attachment 14. Any changes in water quality as a result of surface operations would appear in the surface water monitoring data for Stations D-1, D-2, and D-3 which in addition to monitoring well W-1, show little or no degradation of water quality.

The refuse disposal area and the No. 2 Slurry Impoundment contribute small amounts of pollutants to Perkins Run in the form of seepage which are so insignificant as not to impact surface water monitoring stations D-2 and D-1. (Please refer to Attachment 14). This seepage will cause a general increase in solids and a decrease in pH in the water discharged from Sediment Pond No. 9 located below the No. 2 Slurry Impoundment. The refuse area is located to the north and adjacent to a refuse embankment which was constructed around 1975. The embankment toe is immediately adjacent to Perkins Run to which it intermittently contributes seepage from the interior of the embankment. Seepage impacts from refuse structures appear negligible in light of data collected from surface water monitoring station D-2 and Well Station W-2. Data for Station D-2 shows consistently low metals content with pH in the range of 7.6 to 8.3 S.U. Data for Station W-3 shows similar acceptable quality.

Permit Area Probable Hydrologic Consequences

The probable hydrologic consequences that can be predicted as a result of operations in the permit area include the following:

1. A reduction in rate of surface runoff to Captina Creek and tributaries due to collection and retention in ponds and impoundments;
2. local increases in runoff (both rate and quantity) due to barren and impervious surfaces associated with mine operations;
3. local increases in infiltration to shallow aquifers due to seepage from ponds and impoundments, and increased infiltration resulting from reduced vegetal cover;
4. increased base flows in Captina Creek and tributaries resulting from increased infiltration identified in item 3 above;
5. no significant net change in water quantity within or near the permit area because there are no identified significant additions to or withdrawals from the hydrologic system;
6. no significant changes in water quality within and near the permit area since sediment control and water treatment facilities are operated in accordance with regulation requirements. This is confirmed by baseline surface and ground water monitoring data (Attachment 14 forms, Appendix II).

OHIO DEPARTMENT OF NATURAL RESOURCES DIVISION OF MINERAL RESOURCES MANAGEMENT

THE OHIO VALLEY COAL COMPANY
POWILLAN NO. 6 MINE
PERMIT D-0360
QUARTERLY MONITORING REPORT
1ST QUARTER 2002

PRE-MINING X MINING POST MINING

Units	MONITORING SITE												GROUNDWATER WELLS											
	PRE-MINING						MINING						POST MINING											
	W-1	W-2	U-1	D-1	D-2	D-3	U6-1	DS6-7	FD-1	FD-2	Parad 13	99-3S	98-5S	00-2S	02/13/02	98-4S	99-1S	99-5S	98-3S	98-4S	99-1S	99-5S	98-3S	98-4S
Date	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02	02/13/02
FT	835	950	840	840	835	830	840	1120	895	895	900	1178	1126	836	1133	899	903	1257	1135	899	903	1257	1135	899
FT	15	UNK	--	--	--	--	--	--	--	--	--	116	51	15	116	56	49	178	52	116	56	49	178	52
FT	13	28	--	--	--	--	--	--	--	--	--	79.5	38.5	5	87.5	29	40.5	154	43.5	87.5	40.5	154	43.5	87.5
GFS	--	--	126	126.4	0.22	0.28	125.6	2.2 gpm	2.1 gpm	10.7 gpm	98.200 GPD	--	--	--	--	--	--	--	--	--	--	--	--	--
S.U.	7.3	7.6	8.8	8.8	8.6	8.4	8.8	7.4	7.2	6.9	8.6	9.1	6.6	6.8	8.3	6.9	8.9	8.2	6.8	6.9	8.9	8.2	6.8	6.9
1.0 mg/l	9.1	5.0	ND	ND	ND	1.1	ND	6.5	37	30	1.9	ND	8.4	14	ND	36	ND	ND	17	36	ND	ND	17	36
1.2 mg/l	350	260	110	120	150	160	120	210	650	710	510	480	160	310	1200	500	360	1600	130	500	360	1600	130	500
0.05 mg/l	ND	0.25	0.08	0.07	ND	0.17	0.09	0.07	0.12	5.6	0.26	0.80	3.6	ND	0.05	1.5	0.11	ND	ND	0.05	1.5	0.11	ND	ND
0.02 mg/l	ND	0.23	0.03	0.03	0.06	0.09	0.03	0.02	3.5	6.1	0.33	ND	0.12	0.03	ND	0.46	ND	0.04	0.69	0.46	ND	0.04	0.69	0.46
1.0 mg/l	55	ND	ND	ND	ND	ND	ND	ND	ND	22	13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1.0 mg/l	510	260	150	140	270	300	130	220	970	550	360	ND	210	500	10	1400	310	2.7	520	1400	310	2.7	520	1400
1.5 mg/l	290	65	72	66	170	230	46	34	1900	1400	2200	140	110	150	42	2200	1800	5400	1100	2200	1800	5400	1100	2200
1.5 umhos/cm	1100	530	380	510	670	820	510	430	4000	3300	5000	1200	490	1000	2200	4200	1800	5400	1100	4200	1800	5400	1100	4200
0.09 mg/l	0.22	0.12	0.48	0.40	0.12	0.12	0.42	0.42	0.15	0.15	0.22	0.36	0.32	0.42	0.14	0.22	2.8	0.10	0.20	0.22	2.8	0.10	0.20	0.22
1.0 mg/l	*	*	*	230	*	*	190	*	3800	2900	4100	*	*	690	1400	3800	920	2300	1000	3800	920	2300	1000	3800
0.001 mg/l	*	*	*	ND	*	*	ND	*	ND	0.001	ND	*	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
0.005 mg/l	*	*	*	0.02	*	*	0.01	*	0.007	0.01	0.01	*	*	ND	ND	0.007	0.006	0.01	0.02	0.007	0.006	0.01	0.02	0.007
0.05 mg/l	*	*	*	0.08	*	*	0.09	*	0.11	0.10	0.08	*	*	0.07	0.05	0.07	0.10	0.07	0.06	0.07	0.10	0.07	0.06	0.07
0.05 mg/l	*	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	0.05	ND	0.08	0.04	ND	ND	0.08	0.04	ND	ND
0.001 mg/l	*	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
0.01 mg/l	*	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
0.01 mg/l	*	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
0.10 mg/l	*	*	15	13	*	*	10	*	250	180	280	*	*	74	36	140	62	530	4.3	140	62	530	4.3	140
0.50 mg/l	*	*	18	17	*	*	17	*	900	790	1300	*	*	35	580	650	340	970	28	580	650	340	970	28
0.02 mg/l	*	*	*	0.06	*	*	0.06	*	0.38	0.37	1.3	*	*	0.05	7.6	0.02	0.27	1.4	0.25	0.02	0.27	1.4	0.25	0.02
0.02 mg/l	*	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
0.01 mg/l	*	*	*	0.17	*	*	0.13	*	0.15	0.25	0.17	*	*	0.17	0.18	0.09	0.16	0.31	0.17	0.17	0.18	0.09	0.16	0.31
0.50 mg/l	*	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
0.002 mg/l	*	*	*	0.0049	*	*	ND	*	ND	ND	ND	*	*	ND	ND	ND	ND	ND	0.0080	ND	ND	ND	ND	ND
0.0001 mg/l	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MDL																								

* ANALYSIS NOT REQUIRED
ND NOT DETECTED AT MDL METHOD DETECTION LIMIT

PERMITTEE'S SIGNATURE: David L. B. Anteen

LABORATORY NAME: TRADET, INC.

DATE: 4-15-02

ANALYST'S SIGNATURE: Andrew R. Wasko II

DATE: 4/9/02

Andrew R. Wasko II, General Laboratory Manager

OHIO DEPARTMENT OF NATURAL RESOURCES DIVISION OF MINERAL RESOURCES MANAGEMENT

THE OHIO VALLEY COAL COMPANY
POWATAN NO. 6 MINE
PERMIT D-0360
QUARTERLY MONITORING REPORT
2ND QUARTER 2002

PRE-MINING X MINING POST-MINING

QUARTERLY MONITORING REPORT																				
2ND QUARTER 2002																				
ELEVATION DEPTH BELOW LAND SURFACE STATIC WATER LEVEL FLOW	MONITORING SITE										GROUNDWATER WELLS									
	W - 1	W - 2	U - 1	D - 1	D - 2	D - 3	U6 - 1	D56 - 7	FD - 1	FD - 2	Pond 13	99-3S	98-5S	00-3S	00-2D	98-4S	99-1S	99-5S	98-3S	
	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	
	FT	835	950	840	840	835	830	840	1120	895	895	900	1178	1126	836	1133	899	903	1257	1135
	FT	15	UNK	--	--	--	--	--	--	--	--	--	--	51	15	116	56	49	178	52
CFS	--	--	133.3	134.1	0.32	0.48	127	3.1 gpm	8.2 gpm	10 gpm	107 gpm	--	--	--	--	--	--	--	--	--
pH	S.U.	7.5	7.7	8.6	8.7	8.1	8.2	8.7	7.5	7.2	8.4	9.0	6.8	6.9	8.5	7.1	8.9	8.2	6.6	
TOTAL ACIDITY	1.0 mg/l	12	6.8	ND	ND	4.2	4.4	2.1	11	25	45	10	19	6.1	ND	43	*	13	*	
TOTAL ALKALINITY	1.2 mg/l	330	250	120	120	160	200	110	230	600	670	580	450	180	300	1200	520	320	1400	
TOTAL IRON	0.04 mg/l	0.32	0.90	0.19	0.09	2.1	0.08	ND	ND	0.12	10.0	0.20	0.60	4.6	ND	0.06	0.14	*	ND	
TOTAL MANGANESE	0.01 mg/l	0.05	0.53	0.07	0.08	0.22	0.13	0.06	0.05	2.9	4.5	0.21	0.01	0.17	0.03	0.03	0.61	*	0.02	
TOTAL TOTAL SUSPENDED SOLIDS	1.0 mg/l	61	ND	ND	ND	84	ND	ND	ND	ND	8.5	16	ND	ND	ND	4.0	ND	*	ND	
TOTAL HARDNESS	1.0 mg/l	360	290	140	160	290	340	140	200	890	460	390	10	240	360	ND	1400	*	30	
TOTAL SULFATES	1.5 mg/l	70	77	91	75	150	210	41	33	1700	1300	2800	130	76	120	13	2100	290	3.6	
TOTAL SPECIFIC CONDUCTANCE	1.5 umhos/cm	770	660	520	510	700	960	330	520	13000	8800	13000	1000	440	900	1900	4100	1300	3500	
TOTAL NITRATE	0.09 mg/l	ND	ND	ND	ND	ND	ND	ND	0.26	ND	ND	ND	*	*	*	*	*	*	*	
TOTAL TOTAL DISSOLVED SOLIDS	10 mg/l	*	*	*	270	*	*	200	*	3600	2800	5600	*	*	590	1300	3700	870	2400	
TOTAL ARSENIC	0.001 mg/l	*	*	*	ND	*	*	ND	*	ND	0.002	0.001	*	0.0013	0.0012	0.0010	*	0.0019	*	
TOTAL CADMIUM	0.02 mg/l	*	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	ND	ND	*	ND	
TOTAL CHROMIUM	0.05 mg/l	*	*	*	ND	*	*	ND	*	0.05	ND	ND	*	*	ND	ND	ND	*	ND	
TOTAL LEAD	0.03 mg/l	*	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	ND	ND	*	ND	
TOTAL SELENIUM	0.020 mg/l	*	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	ND	ND	*	ND	
TOTAL COPPER	0.01 mg/l	*	*	*	ND	*	*	ND	*	0.01	ND	ND	*	*	ND	ND	0.01	*	ND	
TOTAL ZINC	0.01 mg/l	*	*	*	0.03	*	*	0.03	*	0.03	0.08	0.04	*	0.15	0.07	0.11	*	0.05	*	
TOTAL ALUMINUM	0.10 mg/l	*	*	*	0.21	*	*	0.16	*	0.12	0.24	0.30	*	0.16	0.35	0.14	*	0.12	*	
TOTAL CHLORIDE	0.50 mg/l	*	*	*	15	*	*	4.5	*	230	150	340	*	71	13	140	*	530	*	
TOTAL SODIUM	0.01 mg/l	*	*	*	31	*	*	6.8	*	570	800	1600	*	35	490	610	*	900	*	
TOTAL FLUORIDE	0.002 mg/l	*	*	*	0.131	*	*	0.087	*	0.349	0.468	0.982	*	0.065	7.79	0.038	*	1.38	*	
TOTAL SILVER	0.01 mg/l	*	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	ND	ND	*	ND	
TOTAL BARIUM	0.50 mg/l	*	*	*	0.23	*	*	0.22	*	0.26	0.27	0.23	*	0.25	0.28	0.32	*	0.42	*	
TOTAL HEX. CHROMIUM	0.002 mg/l	*	*	*	ND	*	*	ND	*	0.01	0.01	ND	*	0.01	0.01	0.01	*	0.01	*	
TOTAL MERCURY	0.0001 mg/l	*	*	*	0.0009	*	*	0.0009	*	0.0007	0.0008	0.0007	*	0.0035	0.0012	0.0020	*	0.0014	*	

* ANALYSIS NOT REQUIRED
ND NOT DETECTED AT MDL: METHOD DETECTION LIMIT

PERMITTEE'S SIGNATURE: David L. Bantach DATE: 7-12-02

LABORATORY NAME: TRADET, INC.

ANALYST'S SIGNATURE: Andrew R. Wasko II DATE: 7/5/02
Andrew R. Wasko II, General Laboratory Manager

THE OHIO VALLEY COAL COMPANY
POWATHAN NO. 6 MINE
PERMIT D-0360
QUARTERLY MONITORING REPORT
3RD QUARTER 2002

ANALYSIS NOT REQUIRED
NOT DETECTED AT MDL: METHOD DETECTION LIMIT

DATE:

LABORATORY NAME:

Andrew R. Wasiko II, General Laboratory Manager

DATE: _____

THE OHIO VALLEY COAL COMPANY
POWELLTAN NO. 6 MINE
PERMIT D-0360
QUARTERLY MONITORING REPORT
FIFTH QUARTER 2002

ANALYSIS NOT REQUIRED
NOT DETECTED AT MDL: METHOD DETECTION LIMIT

LABORATORY NAME: TRADET, INC.

ANALYST'S SIGNATURE:  DATE: 12/10/02

6. *Where the isolation distance between the uppermost aquifer system and the bottom of the disposal unit is less than five feet of insitu geologic material.*

Response: The isolation distance between the bottom of the proposed coarse coal refuse and uppermost aquifer was determined from excavating test pits in the valley floor. The isolation distance ranged from 5.4 to 10.5 feet in five of the six pits. The minimum distance was 3.1 feet in test pit TP-7. Test pit results are found in Appendix II of this report.

Where less than five-feet of isolation distance naturally occurs, earthen fill will be added to provide a minimum of five-feet of isolation to the uppermost aquifer.

7.3 Probable Hydrologic Consequences

The proposed facility has the potential to produce acid drainage as well as high concentrations of suspended and dissolved solids, and metals such as iron and manganese. The construction, operation, maintenance, water monitoring and reclamation proposed are designed to mitigate or eliminate these effects. Consequently, there are no significant adverse impacts on the surface water, groundwater regime or hydrologic balance either on or off the site.

7.3.1 Surface Water

7.3.1.1 Surface Water Quantity

The proposed operation is expected to reduce base flows and peak flows in the downstream section of Perkins Run, due to the retention characteristics of the proposed sediment and quality control ponds. Runoff from the project or disturbed areas, which presently contributes to stream flow will be directed to sediment ponds. However, Perkins Run, which has intermittent flow during summer months, has no downstream users. Perkins Run discharges into Captina Creek. Since the area drained by Perkins Run represents a small percentage of the Captina Creek drainage basin, there should not be any recognizable difference in quantity flow in Captina Creek. It is predicted that the proposed operation will not result in any significant adverse impacts on surface water quantity in the area.

7.3.1.2 Surface Water Quality

The proposed operation could have both short-term and long-term impacts on the surface water quality in the receiving stream, especially during the early stages of construction. For instance, sediment loads to the drainage system will be increased. These impacts will be mitigated through proper execution of construction, operations, maintenance, water monitoring and reclamation. The quantity of sediment reaching surface waters should be minimized by directing all runoff through the proposed sedimentation pond and other erosion control facilities.

Diversion ditches will be installed to direct runoff away from the coarse coal refuse area. Runoff entering the refuse pile and leachate, if any, collected by the underdrain system may be high in iron and low in pH. This drainage will be directed to the sediment pond for treatment, if necessary, flow to the polishing pond, checked for quality, if the water meets permit compliance standards it will then be released to the receiving stream.

Long-term impacts are mitigated through implementation of the reclamation plan. The refuse surface will be graded, capped with two-feet of clay, compacted to achieve a permeability of E-07 or less, covered with up to an additional two-feet of earthen material and seeded. This cap and cover system is designed to minimize or eliminate the formation of leachate. The surface will be graded to promote immediate drainage. Water will not pond or accumulate on the reclaimed surface. Further, the clay cap will minimize infiltration and prevent oxidation of the coal refuse.

7.3.2 Groundwater

7.3.2.1 Groundwater Quantity

The proposed operation may locally reduce the groundwater recharge capabilities due to the following factors. First, the Perkins Run valley is to be filled with coal refuse, which is largely composed of claystone that becomes relatively impervious when compacted. Second, upon completion, approximately 100 acres will be capped with two-feet of impervious clay. Third, underdrains will be installed to intercept the majority of seepage through the fill area.

There are no down-gradient groundwater users in the immediate area. Since the affected area is small, there should be no short-term or long-term adverse impacts on regional groundwater availability.

7.3.2.2 Groundwater Quality

Based on the refuse characteristics, there is the potential that the proposed operation could produce high iron, acidic drainage. The impact is mitigated or eliminated through proper construction, engineering, maintenance, water monitoring and final reclamation. The proposed facility incorporates the following preventative measures. First, a groundwater underdrain system will be installed to collect, and convey down-gradient all seepage beneath the structure. Second, an impervious clay liner will be installed to separate the groundwater underdrain system from the coal refuse. The liner will be three-feet thick minimum, and compacted to permeability of E-07 or less. Along the valley bottom, the liner will be graded to slope 1% eastward and down the valley at existing grades to allow for leachate collection. Third, a leachate collection drain will be installed along the liner's eastern edge to convey leachate, if any, to the toe of the structure where it will drain to a clay lined pond for possible treatment. Fourth, coal refuse will be compacted to reduce oxidation of the acid producing constituents, mainly pyritic sulphur, and seepage through the refuse material. Fifth, an impervious clay cap will be installed, as cited in Section 7.3.1.2, to prevent surface water from migrating into and through the refuse fill, thereby eliminating or reducing the chance for leachate generation.

Through proper construction of the control features cited above, the proposed facility is not expected to have significant short-term or long-term adverse affects on groundwater quality in the area.



341

Ohio Department of Natural Resources

DIVISION OF RECLAMATION

Fountain Square • Columbus, Ohio • 43224 • (614) 466-4850

October 16, 1980

The NACCO Mining Company
Powhatan Point, Ohio 43942

RE: Buffer Zone Variance
Mine No. 6, I.D. No. 33-01159

Dear Mr. McGregor:

Your request for a buffer zone variance at Mine No. 6 for the areas within one hundred (100) feet of Captina Creek and Perkins Run is granted subject to the following performance standards:

- 1) The waterway(s) shall be separated from the disturbed area by a dike or diversion that will direct surface drainage through a treatment system prior to entering the waterway(s).
- 2) Areas between the waterway(s) and the dike or diversion must be protected from erosion and kept free of all acid or toxic-forming materials.

0341

Sincerely,

Charles E. Call
Charles E. Call, Chief
Division of Reclamation

RJR/nlb

cc: J. Sprouse
File

APPROVED ☒
April 6, 1984
Larry M. Moore
Chief

THE NORTH AMERICAN COAL CORPORATION
CENTRAL DIVISION
ENVIRONMENTAL DEPARTMENT

007 20 1680
Powhatan Pt., Ohio



DEPARTMENT OF THE ARMY
PITTSBURGH DISTRICT, CORPS OF ENGINEERS
WILLIAM S. MOORHEAD FEDERAL BUILDING
1000 LIBERTY AVENUE
PITTSBURGH, PA 15222-4186

REPLY TO
ATTENTION OF:

August 13, 2004

Operations and Readiness Division
Regulatory Branch
200300853

Mr. Dave Bartsch
The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Dear Mr. Bartsch:

I refer to your Department of the Army Permit Application, received in this office July 12, 2004, regarding your proposal to raise the level of the existing No. 2 Slurry Impoundment located in Belmont County, Ohio.

The project includes elevation of the spillway and slurry decant pipe being raised by ten feet. The impoundment is currently permitted at 1,120 feet and the elevation to which it is proposed to be raised is 1,130 feet above sea level. Five intermittent and three ephemeral stream channels totaling approximately 865 linear feet will be impacted as a result of the elevation change. Mitigation will involve 865 linear feet of Millers Run. The mitigated stream will be dedicated in perpetuity through a deed restriction by the American Energy Corporation.

Activities associated with projects of this type are authorized by Nationwide Permit No. 21 (see enclosure), previously issued by the Corps of Engineers, for purposes of Section 404 of the Clean Water Act as published in the January 15, 2002 issue of the Federal Register.

Enclosed is a list of conditions which must be followed for the Nationwide Permit to be valid. Adherence to these conditions will permit you to proceed with the proposed project. Please add the following conditions:

1. The American Energy Corporation must provide a Notarized letter to the Corps of Engineers, Pittsburgh District certifying the information described in your mitigation plan within 60 days of the completion date for the proposed expansion project.
2. As-Built drawings must be provided to this office after the stream mitigation documentation is filed.

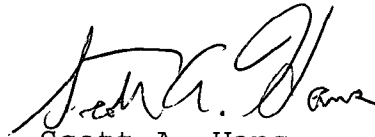
Please Note, the attached Compliance Certification Form must be signed and returned to this office upon completion of the proposed work.

The verification of this Nationwide Permit is valid until August 13, 2006 unless the Nationwide Permit is modified, suspended, or revoked. If project specifications are changed or work has not been initiated before August 13, 2006, please contact this office for further approval.

The issuance of this Nationwide Permit will not relieve you of the responsibility to obtain any other required state, local, or Federal authorizations.

If you have any questions, please contact Allen Edris at (412) 395-7158.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott A. Hans".

Scott A. Hans
Acting Chief,
Regulatory Branch

Enclosure

CF:

Ohio EPA (Randy Bournique)
ODNR (Tereva Knasel)
ODNR (Kevin Ricks)

Compliance Certification Form

PERMIT NUMBER: 200300853

NAME OF PERMITTEE: The Ohio Valley Coal Company

DATE OF ISSUANCE: August 13, 2004

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Pittsburgh District
Regulatory Branch, Room 1834
William S. Moorhead Federal Building
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

Please note that your permitted activity is subject to compliance inspection by a U.S. Army Corps of Engineers Representative. If you fail to comply with this permit, you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

Signature of Permittee



Public Notice

**U.S. Army Corps
of Engineers**
Pittsburgh District

In Reply Refer to
Notice No. below

US Army Corps of Engineers, Pittsburgh District
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

Notice No. 02-NWP5

Date: September 4, 2002

NATIONWIDE PERMITS FOR THE STATE OF OHIO

CORPS OF ENGINEERS REGULATORY PROGRAM ISSUANCE OF NATIONWIDE PERMITS

On January 15, 2002, the Corps of Engineers published, in the Federal Register, the final rule for the administration of its nationwide permit program regulations under the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and the Marine Protection, Research and Sanctuaries Act. The rule became effective on March 18, 2002.

The 15 January 2002 *Federal Register* notice is available on the Internet at <http://www.usace.army.mil/inet/functions/cw/cecwo/reg/>. As an alternative, World Wide Web users can access the *Federal Register* through the U.S. Government Printing Office at http://www.access.gpo.gov/su_docs/aces/aces140.html.

An integral part of the Corps' regulatory program is the concept of nationwide permits (NWP) for minor activities. NWPs are activity specific, and are designed to relieve some of the administrative burdens associated with permit processing for both the applicant and the Federal government. The NWPs, published in the January 15, 2002, Federal Register, Issuance of Nationwide Permits (67 FR 2020), are issued by the Chief of Engineers, and are intended to apply throughout the entire United States and its territories. For convenience, all NWPs with the appropriate regional, general and special conditions are attached. This public notice is available at the Pittsburgh District Regulatory Home page:

<http://www.lrp.usace.army.mil/or/or-f/permits.htm>

In response to the January 15, 2002, Federal Register Notice (67 FR 2020), the State of Ohio Environmental Protection Agency (OEPA) has finalized the Section 401 water quality certification, pending compliance with certain conditions and/or limitations, for the NWPs 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43.

An individual State Water Quality certification is required for Nationwide Permit No. 17. Certification response is not applicable to NWP No. 24.

Authorization for discharges covered by nationwide permits is denied without prejudice if: (1) the State Certification has been denied; or (2) the discharge is not in compliance with

conditions imposed in the State Certification. Applicants wishing to conduct such discharges must first obtain either an individual water quality certificate or waiver from:

Director
Ohio Environmental Protection Agency
Division of Surface Water
Post Office Box 1049
Columbus, Ohio 43216-3669

Some nationwide permits require advance notification. The notification must be made in writing as early as possible prior to commencing the proposed activity. The notification procedures are located under General Condition 13. The notification to the Corps can be made concurrently with the request for individual state certification, if required.

For activities involving Section 10 of the Rivers and Harbors Act of 1899, the permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

Assistance and further information regarding all aspects of the Corps of Engineers regulatory program may be obtained by contacting:

BUFFALO DISTRICT

Name: Paul G. Leuchner, Chief Regulatory Branch
Address: U.S. Army Corps of Engineers, Buffalo District
1776 Niagara Street
Buffalo, New York 14207-3199
Phone: 716-879-4330

HUNTINGTON DISTRICT

Name: Ginger Mullins, Chief, Regulatory Branch
Address: U.S. Army Corps of Engineers, Huntington District
502 Eighth Street
Huntington, West Virginia 25701-2070
Phone: 304-529-5487


LOUISVILLE DISTRICT

Name: James Townsend, Chief Regulatory Branch
Address: U.S. Army Corps of Engineers, Louisville District
Post Office Box 59
Louisville, Kentucky 40201-0059
Phone: 502-582-6461

PITTSBURGH DISTRICT

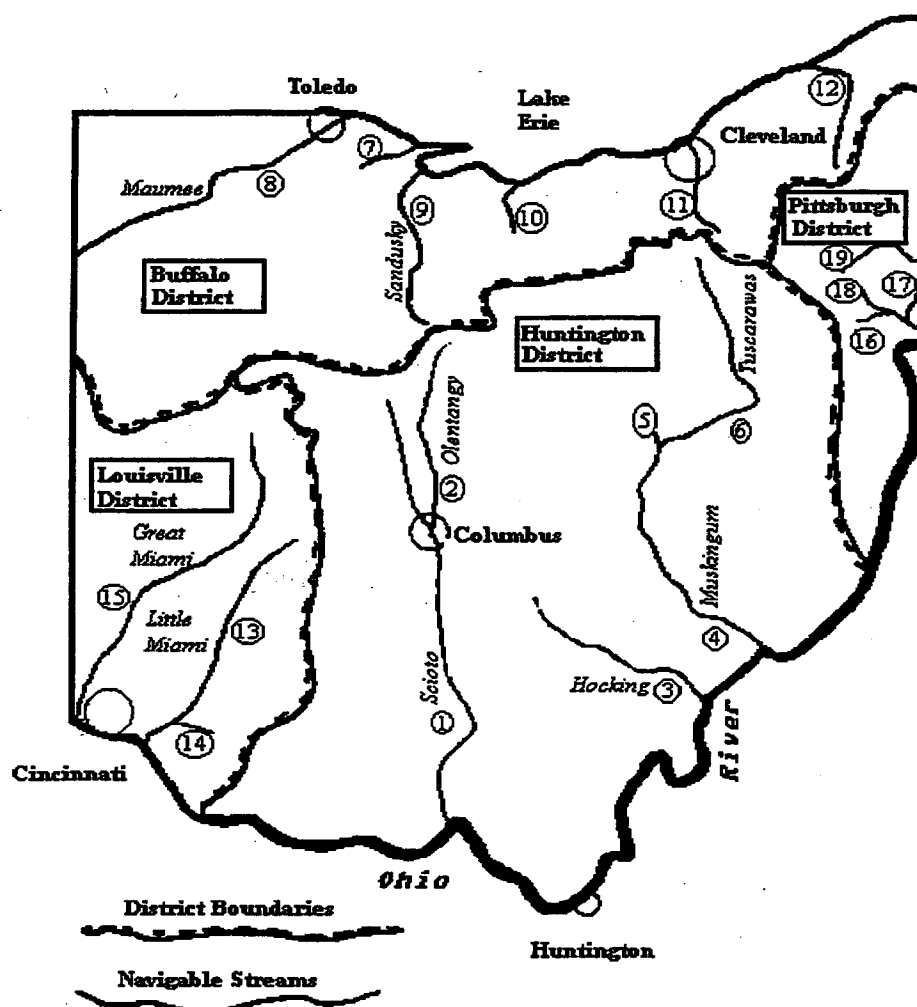
Name: Al Rogalla, Chief Regulatory Branch
Address: U.S. Army Corps of Engineers, Pittsburgh District
William S. Moorhead Federal Building
1000 Liberty Avenue
Pittsburgh, Pennsylvania 15222-4186
Phone: 412-395-7155

Attached is a map showing the district boundaries for the State of Ohio.



Albert H. Rogalla
Chief, Regulatory Branch

Corps Districts and Navigable Streams in The State of Ohio



Navigable Limits of Major Section 10 Streams in Ohio (Due to the scale of this map, all Section 10 Streams are not shown. Contact the proper District office for information.)

Huntington District

Scioto River.....175.0 miles
Olentangy River.....74.3 miles
Hocking River.....79.0 miles
Muskingum River.....112.5 miles
Walhonding River.....8.8 miles
Tuscarawas River.....113.3 miles

Louisville District

Little Miami River.....90.7 miles
E. Fk. Little Miami River.....6.4 miles
Great Miami River.....117.0 miles

Buffalo District

Portage River.....12.0 miles
Maumee River.....To Ind. St. Line
Sandusky River.....96.0 miles
Huron River.....10.0 miles
Cuyahoga River.....41.1 miles
Grand River.....91.6 miles

Pittsburgh District

Little Beaver Creek.....15.7 miles
Middle Fk. L. B. Creek...17.3 miles
North Fk. L. B. Creek....14.3 miles
Mahoning River.....41.0 miles

**A. INDEX OF NATIONWIDE PERMITS, CONDITIONS, FURTHER INFORMATION,
DEFINITIONS, REGIONAL GENERAL CONDITIONS, AND OHIO STATE
CERTIFICATION GENERAL CONDITIONS**

Nationwide Permits

1. Aids to Navigation
2. Structures in Artificial Canals
3. Maintenance
4. Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities
5. Scientific Measurement Devices
6. Survey Activities
7. Outfall Structures and Maintenance
8. Oil and Gas Structures
9. Structures in Fleeting and Anchorage Areas
10. Mooring Buoys
11. Temporary Recreational Structures
12. Utility Line Activities
13. Bank Stabilization
14. Linear Transportation Projects
15. U.S. Coast Guard Approved Bridges
16. Return Water From Upland Contained Disposal Areas
17. Hydropower Projects
18. Minor Discharges
19. Minor Dredging
20. Oil Spill Cleanup
21. Surface Coal Mining Activities
22. Removal of Vessels
23. Approved Categorical Exclusions
24. State Administered Section 404 Programs
25. Structural Discharges
26. [Reserved]
27. Stream and Wetland Restoration Activities
28. Modifications of Existing Marinas
29. Single-family Housing
30. Moist Soil Management for Wildlife
31. Maintenance of Existing Flood Control Facilities
32. Completed Enforcement Actions
33. Temporary Construction, Access and Dewatering
34. Cranberry Production Activities
35. Maintenance Dredging of Existing Basins
36. Boat Ramps
37. Emergency Watershed Protection and Rehabilitation
38. Cleanup of Hazardous and Toxic Waste
39. Residential, Commercial, and Institutional Developments
40. Agricultural Activities
41. Reshaping Existing Drainage Ditches
42. Recreational Facilities

- 43. Stormwater Management Facilities
- 44. Mining Activities

Nationwide Permit General Conditions

- 1. Navigation
- 2. Proper Maintenance
- 3. Soil Erosion and Sediment Controls
- 4. Aquatic Life Movements
- 5. Equipment
- 6. Regional and Case-by-Case Conditions
- 7. Wild and Scenic Rivers
- 8. Tribal Rights
- 9. Water Quality
- 10. Coastal Zone Management
- 11. Endangered Species
- 12. Historic Properties
- 13. Notification
- 14. Compliance Certification
- 15. Use of Multiple Nationwide Permits.
- 16. Water Supply Intakes
- 17. Shellfish Beds
- 18. Suitable Material
- 19. Mitigation
- 20. Spawning Areas
- 21. Management of Water Flows
- 22. Adverse Effects from Impoundments
- 23. Waterfowl Breeding Areas
- 24. Removal of Temporary Fills
- 25. Designated Critical Resource Waters
- 26. Fills Within 100-year Floodplains
- 27. Construction Period

Further Information

Definitions

Best Management Practices (BMPs)
Compensatory Mitigation
Creation
Enhancement
Ephemeral Stream
Farm Tract
Flood Fringe
Floodway
Independent Utility
Intermittent Stream
Loss of Waters of the US

Non-tidal Wetland
Open Water
Perennial Stream
Permanent Above-grade Fill
Preservation
Restoration
Riffle and Pool Complex
Single and Complete Project
Stormwater Management
Stormwater Management Facilities
Stream Bed
Stream Channelization
Tidal Wetland
Vegetated Buffer
Vegetated Shallows
Waterbody

Regional Conditions - Specific regional conditions are listed below each NWP. Regional General conditions are listed under Section F, titled "Regional General Conditions."

Ohio State Certification General Conditions - are listed in Section G

B. NATIONWIDE PERMITS AND CONDITIONS.

1. *Aids to Navigation.* The placement of aids to navigation and Regulatory markers which are approved by and installed in accordance with the requirements of the U.S. Coast Guard (USCG) (See 33 CFR, chapter I, subchapter C part 66).
(Section 10)

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

2. *Structures in Artificial Canals.* Structures constructed in artificial canals within principally residential developments where the connection of the canal to navigable water of the US has been previously authorized (see 33 CFR 322.5(g)).
(Section 10)

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

3. *Maintenance.* Activities related to: (i) The repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure, or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area including those due to changes in materials, construction techniques, or current construction codes or safety standards which are necessary to make repair, rehabilitation, or replacement are permitted, provided the adverse environmental effects resulting from such repair, rehabilitation, or replacement are minimal. Currently serviceable means useable as is or with some maintenance, but not so degraded as to essentially require reconstruction. This NWP authorizes the repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events, provided the repair, rehabilitation, or replacement is commenced, or is under contract to commence, within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, this two-year limit may be waived by the District Engineer, provided the permittee can demonstrate funding, contract, or other similar delays.

(ii) Discharges of dredged or fill material, including excavation, into all waters of the US to remove accumulated sediments and debris in the vicinity of, and within, existing structures (e.g., bridges, culverted road crossings, water intake structures, etc.) and the placement of new or additional riprap to protect the structure, provided the permittee notifies the District Engineer in accordance with General Condition 13. The removal of sediment is limited to the minimum necessary to restore the waterway in the immediate vicinity of the structure to the approximate dimensions that existed when the structure was built, but cannot extend further than 200 feet in any direction from the structure. The placement of rip rap must be the minimum necessary to protect the structure or to ensure the safety of the structure. All excavated materials must be deposited and retained in an upland area unless otherwise specifically approved by the District Engineer under separate authorization. Any bank stabilization measures not directly associated with the structure will require a separate authorization from the District Engineer.

(iii) Discharges of dredged or fill material, including excavation, into all waters of the US for activities associated with the restoration of upland areas damaged by a storm, flood, or other discrete event, including the construction, placement, or installation of upland protection structures and minor dredging to remove obstructions in a water of the US. (Uplands lost as a result of a storm, flood, or other discrete event can be replaced without a Section 404 permit provided the uplands are restored to their original pre-event location. This NWP is for the activities in waters of the US associated with the replacement of the uplands.) The permittee must notify the District Engineer, in accordance with General Condition 13, within 12-months of the date of the damage and the work must commence, or be under contract to commence, within two years of the date of the damage. The permittee should provide evidence, such as a recent topographic survey or photographs, to justify the extent of the proposed restoration. The restoration of the damaged areas cannot exceed the contours, or ordinary high water mark, that existed before the damage. The District Engineer retains the right to determine the extent of the pre-existing conditions and the extent of any restoration work authorized by this permit. Minor dredging to remove obstructions from the adjacent waterbody is limited to 50 cubic yards below the plane of the ordinary high water mark, and is limited to the amount necessary to restore the pre-existing bottom contours of the waterbody. The dredging may not be done primarily to obtain fill for any restoration activities. The discharge of dredged or fill material and all related work needed to restore the upland must be part of a single and complete project. This permit cannot be used in conjunction with NWP 18 or NWP 19 to restore damaged upland areas. This permit cannot be used to reclaim historic lands lost, over an extended period, to normal erosion processes.

This permit does not authorize maintenance dredging for the primary purpose of navigation and beach restoration. This permit does not authorize new stream channelization or stream relocation projects. Any work authorized by this permit must not cause more than minimal degradation of water quality, more than minimal changes to the flow characteristics of the stream, or increase flooding (See General Conditions 9 and 21). (Sections 10 and 404)

Note: This NWP authorizes the repair, rehabilitation, or replacement of any previously authorized structure or fill that does not qualify for the Section 404(f) exemption for maintenance.

Nationwide 3 Specific Regional Conditions

- i. (Maintenance) Notification required prior to the use of vertical sheet piling and closed structures in the special habitat waters of Lake Erie (See General Conditions, Critical Resource waters (1)).
- ii. (Discharges of dredged or fill material associated with removal of accumulated sediment and debris in the vicinity of existing structures) The Pre-Construction Notification (PCN) for activities involving the removal of accumulated sediments and debris in the vicinity of existing structures, to restore the waterway to the approximate dimensions that existed when the structure was built, must include evidence of such dimensions. If this information is not available, the PCN must include evidence of the existing depths immediately outside the proposed work area.

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations:

- 1) Total surface water and vegetation impacts on either side of the replacement structure shall be limited to the greater of 25 feet beyond the structure, or 25 feet beyond the toe of the slope of the structure's approach embankment. [Where the use of a crane is necessary to conduct a maintenance activity, total impacts shall not exceed 50 feet on either side of the structure or approach embankment]. In either case, total impacts, including the structure, shall not exceed 200 feet [except for stabilization projects]. Width shall be measured at the structure's narrowest point as it crosses the waterbody, and be measured parallel to stream flow.
- 2) Culvert replacement:
 - a. This Certification shall only authorize minor deviations from the existing structure's centerline and minor deviations in culvert dimensions, unless these deviations are necessary to follow current safety standards.
- 3) Bridge Replacement:
 - a. This Certification shall only authorize minor deviations from the existing structure's centerline, unless these deviations are necessary to follow current safety standards.
 - b. Bridge replacements shall not result in additional lanes unless necessary to follow current safety standards.
- 4) Maintenance or repair of existing fills (stabilization projects):
 - a. Impacts from maintenance or repair of existing fills shall not exceed the dimensions of the fill prior to the damage; and
 - b. This nationwide shall not authorize the replacement of existing open structures, such as piers, with closed structures that are open to the flow of water with structures that are not open to the flow of water.
- 5) For replacement vertical bulkheads, the following conditions apply:
 - a. For ship channels and harbors adjacent to federal navigation channels within the following harbors: Sandusky Harbor, Huron Harbor, Vermilion Harbor, Lorain Harbor, Conneaut Harbor, Port Clinton Harbor, Rocky River Harbor, Cleveland Harbor, Fairport Harbor, Ashtabula Harbor, and Toledo Harbor, 1,000 feet of existing vertical bulkheads may be replaced if recessed areas for aquatic habitat, or other aquatic habitat improvements, are incorporated within the design and construction of the replacement vertical bulkhead;
 - b. For all other areas, except Lake Erie, Lake Erie Islands, or Sandusky Bay, up to 1,000 feet of existing vertical bulkheads may be replaced. Toe stone shall be placed at the

base of these new replacement vertical bulkheads except in areas where the shoreline is composed of bedrock and slopes are predominately greater than 75 percent;

- c. Replacement vertical bulkheads are not to be placed more than one foot waterward of the intersection of the ordinary high water level of the waterbody and the existing shoreline;
- d. Minor dredging necessary for the installation of the replacement vertical bulkhead is authorized;
- e. Placement of fill between the replacement vertical bulkhead and existing shoreline is authorized; and
- f. Toe stone shall be placed at the base of these new replacement vertical bulkheads except in areas where the original shoreline is composed of bedrock and slopes are predominately greater than 75 percent or where the placement of toe stone would interfere with shipping activity. When required, toe stone shall be placed at an average rate of one-third the total height of the replacement vertical bulkhead at a 2:1 slope.

6) Removal of accumulated sediment:

- a. Removal of accumulated sediment shall occur only once per year, except in cases of emergency situations which threaten life or property.
- b. Removal of accumulated sediments shall be limited to low-flow conditions whenever practicable, except in cases of emergency situations which threaten life or property.

4. Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities.

Fish and wildlife harvesting devices and activities such as pound nets, crab traps, crab dredging, eel pots, lobster traps, duck blinds, clam and oyster digging; and small fish attraction devices such as open water fish concentrators (sea kites, etc.). This NWP authorizes shellfish seeding provided this activity does not occur in wetlands or sites that support submerged aquatic vegetation (including sites where submerged aquatic vegetation is documented to exist, but may not be present in a given year.). This NWP does not authorize artificial reefs or impoundments and semi-impoundments of waters of the US for the culture or holding of motile species such as lobster or the use of covered oyster trays or clam racks. (Sections 10 and 404)

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations: This Nationwide Permit shall not authorize weirs and flumes.

5. Scientific Measurement Devices. Devices, whose purpose is to measure and record scientific data such as staff gages, tide gages, water recording devices, water quality testing and

improvement devices and similar structures. Small weirs and flumes constructed primarily to record water quantity and velocity are also authorized provided the discharge is limited to 25 cubic yards and further for discharges of 10 to 25 cubic yards provided the permittee notifies the District Engineer in accordance with the "Notification" General Condition.
(Sections 10 and 404)

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations: This Nationwide Permit shall not authorize weirs and flumes.

6. Survey Activities. Survey activities including core sampling, seismic exploratory operations, plugging of seismic shot holes and other exploratory-type bore holes, soil survey, sampling, and historic resources surveys. Discharges and structures associated with the recovery of historic resources are not authorized by this NWP. Drilling and the discharge of excavated material from test wells for oil and gas exploration is not authorized by this NWP; the plugging of such wells is authorized. Fill placed for roads, pads and other similar activities is not authorized by this NWP. The NWP does not authorize any permanent structures. The discharge of drilling mud and cuttings may require a permit under Section 402 of the CWA.
(Sections 10 and 404)

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

7. Outfall Structures and Maintenance. Activities related to: (i) Construction of outfall structures and associated intake structures where the effluent from the outfall is authorized, conditionally authorized, or specifically exempted, or are otherwise in compliance with regulations issued under the National Pollutant Discharge Elimination System Program (Section 402 of the CWA), and

(ii) Maintenance excavation, including dredging, to remove accumulated sediments blocking or restricting outfall and intake structures, accumulated sediments from small impoundments associated with outfall and intake structures, and accumulated sediments from canals associated with outfall and intake structures, provided that the activity meets all of the following criteria:

- a. The permittee notifies the District Engineer in accordance with General Condition 13;
- b. The amount of excavated or dredged material must be the minimum necessary to restore the outfalls, intakes, small impoundments, and canals to original design capacities and design configurations (i.e., depth and width);
- c. The excavated or dredged material is deposited and retained at an upland site, unless otherwise approved by the District Engineer under separate authorization; and
- d. Proper soil erosion and sediment control measures are used to minimize reentry of sediments into waters of the US.

The construction of intake structures is not authorized by this NWP, unless they are directly associated with an authorized outfall structure. For maintenance excavation and dredging to remove accumulated sediments, the notification must include information regarding

the original design capacities and configurations of the facility and the presence of special aquatic sites (e.g., vegetated shallows) in the vicinity of the proposed work.
(Sections 10 and 404)

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations:

- 1) This Certification shall only authorize outfall structures which have been authorized by a Permit-to-Install (PTI) and/or National Pollutant Discharge Elimination System (NPDES) permit issued by Ohio EPA pursuant to Ohio Revised Code Chapter 6111, and Ohio Administrative Code Chapters 3745-31 and -33 and outfall structures from stormwater ponds that do not require an NPDES permit.

8. Oil and Gas Structures. Structures for the exploration, production, and transportation of oil, gas, and minerals on the outer continental shelf within areas leased for such purposes by the DOI, Minerals Management Service (MMS). Such structures shall not be placed within the limits of any designated shipping safety fairway or traffic separation scheme, except temporary anchors that comply with the fairway regulations in 33 CFR 322.5(l). (Where such limits have not been designated, or where changes are anticipated, District Engineers will consider asserting discretionary authority in accordance with 33 CFR 330.4(e) and will also review such proposals to ensure they comply with the provisions of the fairway regulations in 33 CFR 322.5(l). Any Corps review under this permit will be limited to the effects on navigation and national security in accordance with 33 CFR 322.5(f)). Such structures will not be placed in established danger zones or restricted areas as designated in 33 CFR part 334: nor will such structures be permitted in EPA or Corps designated dredged material disposal areas.
(Section 10)

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

9. Structures in Fleeting and Anchorage Areas. Structures, buoys, floats and other devices placed within anchorage or fleeting areas to facilitate moorage of vessels where the USCG has established such areas for that purpose.
(Section 10)

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

10. Mooring Buoys. Non-commercial, single-boat, mooring buoys.
(Section 10)

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

11. *Temporary Recreational Structures.* Temporary buoys, markers, small floating docks, and similar structures placed for recreational use during specific events such as water skiing competitions and boat races or seasonal use provided that such structures are removed within 30 days after use has been discontinued. At Corps of Engineers reservoirs, the reservoir manager must approve each buoy or marker individually.
(Section 10)

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

12. *Utility Line Activities.* Activities required for the construction, maintenance and repair of utility lines and associated facilities in waters of the US as follows:

(i) **Utility lines:** The construction, maintenance, or repair of utility lines, including outfall and intake structures and the associated excavation, backfill, or bedding for the utility lines, in all waters of the US, provided there is no change in preconstruction contours. A "utility line" is defined as any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone, and telegraph messages, and radio and television communication (see Note 1, below). Material resulting from trench excavation may be temporarily sidecast (up to three months) into waters of the US, provided that the material is not placed in such a manner that it is dispersed by currents or other forces. The District Engineer may extend the period of temporary side casting not to exceed a total of 180 days, where appropriate. In wetlands, the top 6" to 12" of the trench should normally be backfilled with topsoil from the trench. Furthermore, the trench cannot be constructed in such a manner as to drain waters of the US (e.g., backfilling with extensive gravel layers, creating a french drain effect). For example, utility line trenches can be backfilled with clay blocks to ensure that the trench does not drain the waters of the US through which the utility line is installed. Any exposed slopes and stream banks must be stabilized immediately upon completion of the utility line crossing of each waterbody.

(ii) **Utility line substations:** The construction, maintenance, or expansion of a substation facility associated with a power line or utility line in non-tidal waters of the US, excluding non-tidal wetlands adjacent to tidal waters, provided the activity does not result in the loss of greater than 1/2-acre of non-tidal waters of the US.

(iii) **Foundations for overhead utility line towers, poles, and anchors:** The construction or maintenance of foundations for overhead utility line towers, poles, and anchors in all waters of the US, provided the foundations are the minimum size necessary and separate footings for each tower leg (rather than a larger single pad) are used where feasible.

(iv) **Access roads:** The construction of access roads for the construction and maintenance of utility lines, including overhead power lines and utility line substations, in non-tidal waters of the US, excluding non-tidal wetlands adjacent to tidal waters, provided the discharges do not cause the loss of greater than 1/2-acre of non-tidal waters of the US. Access roads shall be the minimum width necessary (see Note 2, below). Access roads must be constructed so that the length of the road minimizes the adverse effects on waters of the US and as near as possible to preconstruction contours and elevations (e.g., at grade corduroy roads or geotextile/gravel roads). Access roads constructed above preconstruction contours and elevations in waters of the US must be properly bridged or culverted to maintain surface flows.

The term "utility line" does not include activities which drain a water of the US, such as drainage tile, or french drains; however, it does apply to pipes conveying drainage from another area. For the purposes of this NWP, the loss of waters of the US includes the filled area plus waters of the US that are adversely affected by flooding, excavation, or drainage as a result of the project. Activities authorized by paragraph (i) through (iv) may not exceed a total of 1/2-acre loss of waters of the US. Waters of the US temporarily affected by filling, flooding, excavation, or drainage, where the project area is restored to preconstruction contours and elevation, is not included in the calculation of permanent loss of waters of the US. This includes temporary construction mats (e.g., timber, steel, geotextile) used during construction and removed upon completion of the work. Where certain functions and values of waters of the US are permanently adversely affected, such as the conversion of a forested wetland to a herbaceous wetland in the permanently maintained utility line right-of-way, mitigation will be required to reduce the adverse effects of the project to the minimal level.

Mechanized land clearing necessary for the construction, maintenance, or repair of utility lines and the construction, maintenance and expansion of utility line substations, foundations for overhead utility lines, and access roads is authorized, provided the cleared area is kept to the minimum necessary and preconstruction contours are maintained as near as possible. The area of waters of the US that is filled, excavated, or flooded must be limited to the minimum necessary to construct the utility line, substations, foundations, and access roads. Excess material must be removed to upland areas immediately upon completion of construction. This NWP may authorize utility lines in or affecting navigable waters of the US even if there is no associated discharge of dredged or fill material (See 33 CFR part 322).

Notification: The permittee must notify the District Engineer in accordance with General Condition 13, if any of the following criteria are met:

- (a) Mechanized land clearing in a forested wetland for the utility line right-of-way;
- (b) A Section 10 permit is required;
- (c) The utility line in waters of the US, excluding overhead lines, exceeds 500 feet;
- (d) The utility line is placed within a jurisdictional area (i.e., water of the US), and it runs parallel to a stream bed that is within that jurisdictional area;
- (e) Discharges associated with the construction of utility line substations that result in the loss of greater than 1/10-acre of waters of the US;
- (f) Permanent access roads constructed above grade in waters of the US for a distance of more than 500 feet; or
- (g) Permanent access roads constructed in waters of the US with impervious materials.

(Sections 10 and 404)

Note 1: Overhead utility lines constructed over Section 10 waters and utility lines that are routed in or under Section 10 waters without a discharge of dredged or fill material require a Section 10 permit; except for pipes or pipelines used to transport gaseous, liquid, liquescent, or slurry substances over navigable waters of the US, which are considered to be bridges, not utility lines, and may require a permit from the USCG pursuant to Section 9 of the Rivers and Harbors Act of 1899. However, any discharges of dredged or fill material associated with such pipelines will require a Corps permit under Section 404.

Note 2: Access roads used for both construction and maintenance may be authorized, provided they meet the terms and conditions of this NWP. Access roads used solely for construction of the utility line must be removed upon completion of the work and the area restored to preconstruction contours, elevations, and wetland conditions. Temporary access roads for construction may be authorized by NWP 33.

Note 3: Where the proposed utility line is constructed or installed in navigable waters of the US (i.e., Section 10 waters), copies of the PCN and NWP verification will be sent by the Corps to the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), for charting the utility line to protect navigation.

Nationwide 12 Specific Regional Conditions

- i. Notification for aerial transmission lines over Section 10 waters must include the nominal system voltage and the additional clearance above low steel for bridges, if available, or above maximum high water elevation. See note below.
- ii. (Utility line substations) Notification is required for all work in waters of the U.S., including special aquatic sites.
- iii. (Foundations for overhead utility line towers, poles, and anchors) Notification is required for all stream work (perennial, intermittent, and ephemeral).
- iv. (Access roads) Notification is required for impacts greater than 1/10 acre in waters of the U.S., including wetlands.

Note: Nationwide permit 12(i) for Utility Activities - All aerial crossings will have the following minimum additional clearances above existing fixed bridges, or the clearances which would be required by the U.S. Coast Guard for new fixed bridges:

<u>NOMINAL SYSTEM VOLTAGE, KV</u>	<u>ADDITIONAL CLEARANCE, FEET</u>
115 and below	20
138	22
161	24
230	26
350	30
500	35
700	42
750 - 765	45

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations:

- 1) The length of any buried utility buried line within any single waterbody shall not exceed twice the width of that waterbody at the location of the crossing.
- 2) This Certification shall not authorize the crossing installation of buried utility lines in more than five hundred (500) total linear feet (cumulative for the entire project) of forested wetlands (woody vegetation 6 meters tall or taller).

- 3) Buried utility line stream crossings shall not exceed a total of three (3) per stream mile per stream.
- 4) The total width of any mechanized land clearing or grading for buried utility lines shall not exceed twenty five (25) feet on either side of a utility line, or for a total width of fifty (50) feet on both sides of a utility line.
- 5) All hydric topsoil removed from a trench shall be separated and saved for later placement as the topmost backfill layer when the trench is refilled.
- 6) This Certification shall not authorize the stockpiling of side cast dredged material in excess of 3 months.
- 7) Applicants who intend to use chemicals regulated by the Ohio Department of Agriculture in any waters of the State (including wetlands) shall comply with all Ohio Department of Agriculture requirements regarding the use and application of the chemicals.
- 8) New buried utility lines crossing more than 1,500 feet (cumulative for the entire project) of surface waters (including isolated and non-isolated wetlands, and ephemeral, intermittent, and perennial streams (measured bank-to-bank) and with impacts located in three or more than two Ohio EPA 8-digit hydrologic units as defined in Ohio Administrative Code 3745-1-54(F) are not certified.

13. Bank Stabilization. Bank stabilization activities necessary for erosion prevention provided the activity meets all of the following criteria:

- a. No material is placed in excess of the minimum needed for erosion protection;
- b. The bank stabilization activity is less than 500 feet in length;
- c. The activity will not exceed an average of one cubic yard per running foot placed along the bank below the plane of the ordinary high water mark or the high tide line;
- d. No material is placed in any special aquatic site, including wetlands;
- e. No material is of the type, or is placed in any location, or in any manner, to impair surface water flow into or out of any wetland area;
- f. No material is placed in a manner that will be eroded by normal or expected high flows (properly anchored trees and treetops may be used in low energy areas); and,
- g. The activity is part of a single and complete project.

Bank stabilization activities in excess of 500 feet in length or greater than an average of one cubic yard per running foot may be authorized if the permittee notifies the District Engineer in accordance with the "Notification" General Condition 13 and the District Engineer determines the activity complies with the other terms and conditions of the NWP and the adverse environmental effects are minimal both individually and cumulatively. This NWP may not be used for the channelization of waters of the US. (Sections 10 and 404)

Nationwide 13 Specific Regional Conditions

- Notification is required for the use of vertical bulkheads.

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Limitations and Conditions:

- 1) The following conditions apply to new vertical bulkheads:
 - a. Up to 1,000 feet of new vertical bulkhead may be placed on shorelines on Lake Erie, Lake Erie Islands, and Sandusky Bay that are composed of bedrock with slopes predominately greater than 75 percent. No toe stone shall be placed at the base of these new vertical bulkheads.
 - b. Up to 50 feet of new vertical bulkhead for boat docking purposes may be placed anywhere on Lake Erie, Lake Erie Islands, and Sandusky Bay. Toe stone shall be placed at the base of these new vertical bulkheads except in areas where the shoreline is composed of bedrock and slopes are predominately greater than 75 percent.
 - c. For areas not located on Lake Erie, Lake Erie Islands, or Sandusky Bay, up to 200 feet of new vertical bulkheads may be placed in areas with less than 35 percent of the existing shoreline in the immediate area already with vertical bulkheads. The 35 percent threshold is exceeded when more than 700 of the 2,000 feet of adjacent shoreline (1,000 feet measured from both sides of the proposed vertical bulkhead) is already in vertical bulkhead. Toe stone shall be placed at the base of these new vertical bulkheads except in areas where the shoreline is composed of bedrock and slopes are predominately greater than 75 percent.
 - d. Vertical bulkheads may not be placed more than one foot waterward of the intersection of the ordinary high water level of the waterbody and the existing shoreline;
 - e. Minor dredging necessary for the installation of the vertical bulkhead is authorized;
 - f. Placement of fill between the vertical bulkhead and existing shoreline is authorized; and
 - g. Toe stone, when required, is installed at an average rate of one-third the total height of the vertical bulkhead at a 2:1 slope.
- 2) The following conditions apply to bank stabilization projects not involving vertical bulkheads:
 - a. This Nationwide Permit shall only authorize the use of rock, stone, vegetative erosion control measures, broken concrete (without exposed reinforcing bar) and clean soil.
 - b. Bank stabilization projects on Lake Erie shall be in known Coastal Erosion Areas established by the Ohio Department of Natural Resources.
- 3) The following conditions apply to all bank stabilization projects:

- a. No material shall be placed in such a manner so as to restrict surface water flow into or out of any tributary.
- b. Any fill used for bank stabilization shall be limited to that amount necessary to provide erosion protection.
- c. This Nationwide Permit shall not authorize bank stabilization projects over 1,000 feet in length.

14. Linear Transportation Projects. Activities required for the construction, expansion, modification, or improvement of linear transportation crossings (e.g., highways, railways, trails, airport runways, and taxiways) in waters of the US, including wetlands, if the activity meets the following criteria:

- a. This NWP is subject to the following acreage limits:
 - (1) For linear transportation projects in non-tidal waters, provided the discharge does not cause the loss of greater than 1/2-acre of waters of the US; or
 - (2) For linear transportation projects in tidal waters, provided the discharge does not cause the loss of greater than 1/3-acre of waters of the US.
- b. The permittee must notify the District Engineer in accordance with General Condition 13 if any of the following criteria are met:
 - (1) The discharge causes the loss of greater than 1/10-acre of waters of the US; or
 - (2) There is a discharge in a special aquatic site, including wetlands;
- c. The notification must include a compensatory mitigation proposal to offset permanent losses of waters of the US to ensure that those losses result only in minimal adverse effects to the aquatic environment and a statement describing how temporary losses will be minimized to the maximum extent practicable;
- d. For discharges in special aquatic sites, including wetlands, and stream riffle and pool complexes, the notification must include a delineation of the affected special aquatic sites;
- e. The width of the fill is limited to the minimum necessary for the crossing;
- f. This permit does not authorize stream channelization, and the authorized activities must not cause more than minimal changes to the hydraulic flow characteristics of the stream, increase flooding, or cause more than minimal degradation of water quality of any stream (see General Conditions 9 and 21);
- g. This permit cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars; and
- h. The crossing is a single and complete project for crossing waters of the US. Where a road segment (i.e., the shortest segment of a road with independent utility that is part of a larger project) has multiple crossings of streams (several single and complete projects) the Corps will consider whether it should use its discretionary authority to require an Individual Permit. (Sections 10 and 404)

Note: Some discharges for the construction of farm roads, forest roads, or temporary roads for moving mining equipment may be eligible for an exemption from the need for a Section 404 permit (see 33 CFR 323.4).

Nationwide 14 Specific Regional Conditions

- Notification is required for activities in Section 10 waters.
- Notification is required for all perennial and intermittent stream impacts greater than 200 feet and all ephemeral stream impacts greater than 300 feet.

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations:

- 1) Total surface water and vegetation impacts on either side of the structure shall be limited to the greater of 25 feet beyond the structure, or 25 feet beyond the toe of the slope of the structure's approach embankment. [Where the use of a crane is necessary to construct a linear transportation project, total width of the impacts shall not exceed 50 feet on either side of the structure or approach embankment]. In either case, total impacts, including the structure, shall not exceed 200 feet. Width shall be measured at the structure's narrowest point as it crosses the waterbody, and be measured parallel to stream flow.
- 2) Stream crossings shall not exceed a total of three (3) per stream mile per stream.
- 3) Culverts [except for ephemeral streams]
 - a. At least the lower 10% of all culvert bottoms shall be buried below the existing stream grade. Hydraulic design shall be based upon the remaining open portion of the culvert.
 - b. Additional flood plain culverts shall be installed where the flood prone area is greater than twice the width of the stream at Ordinary High Water Mark (OHWM).

15. U.S. Coast Guard Approved Bridges. Discharges of dredged or fill material incidental to the construction of bridges across navigable waters of the US, including cofferdams, abutments, foundation seals, piers, and temporary construction and access fills provided such discharges have been authorized by the USCG as part of the bridge permit. Causeways and approach fills are not included in this NWP and will require an individual or regional Section 404 permit.
(Section 404)

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

16. Return Water From Upland Contained Disposal Areas. Return water from upland, contained dredged material disposal area. The dredging itself may require a Section 404 permit (33 CFR 323.2(d)), but will require a Section 10 permit if located in navigable waters of the US. The return water from a contained disposal area is administratively defined as a discharge of dredged material by 33 CFR 323.2(d), even though the disposal itself occurs on the upland and does not require a Section 404 permit. This NWP satisfies the technical requirement for a Section

404 permit for the return water where the quality of the return water is controlled by the state through the Section 401 certification procedures.
(Section 404)

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations: This Nationwide Permit shall be limited to the authorization of the disposal of dredged materials dredged from state-owned properties, where there are no known areas of contaminated sediments, provided best management practices are used to minimize adverse impacts to water quality.

17. Hydropower Projects. Discharges of dredged or fill material associated with (a) small hydropower projects at existing reservoirs where the project, which includes the fill, are licensed by the Federal Energy Regulatory Commission (FERC) under the Federal Power Act of 1920, as amended; and has a total generating capacity of not more than 5000 kW; and the permittee notifies the District Engineer in accordance with the "Notification" General Condition; or (b) hydropower projects for which the FERC has granted an exemption from licensing pursuant to Section 408 of the Energy Security Act of 1980 (16 U.S.C. 2705 and 2708) and Section 30 of the Federal Power Act, as amended; provided the permittee notifies the District Engineer in accordance with the "Notification" General Condition.
(Section 404)

Ohio State Certification for this nationwide permit has been denied.

18. Minor Discharges. Minor discharges of dredged or fill material into all waters of the US if the activity meets all of the following criteria:

- a. The quantity of discharged material and the volume of area excavated do not exceed 25 cubic yards below the plane of the ordinary high water mark or the high tide line;
- b. The discharge, including any excavated area, will not cause the loss of more than 1/10-acre of a special aquatic site, including wetlands. For the purposes of this NWP, the acreage limitation includes the filled area and excavated area plus special aquatic sites that are adversely affected by flooding and special aquatic sites that are drained so that they would no longer be a water of the US as a result of the project;
- c. If the discharge, including any excavated area, exceeds 10 cubic yards below the plane of the ordinary high water mark or the high tide line or if the discharge is in a special aquatic site, including wetlands, the permittee notifies the District Engineer in accordance with the "Notification" General Condition. For discharges in special aquatic sites, including wetlands, the notification must also include a delineation of affected special aquatic sites, including wetlands (also see 33 CFR 330.1(e)); and
- d. The discharge, including all attendant features, both temporary and permanent, is part of a single and complete project and is not placed for the purpose of a stream diversion.

(Sections 10 and 404)

The Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Limitations and Conditions:

- 1) If used to authorize utility line backfills and bedding, this Nationwide Permit shall authorize sidecasting or stockpiling of dredged or fill material for a maximum of 3 months.
- 2) Dredged material shall be placed directly at an upland site in such a way that sediment runoff to any surface water is controlled and minimized.
- 3) This Nationwide Permit shall not authorize disposal of fill material into Lake Erie, where that is the primary project purpose.

19. Minor Dredging. Dredging of no more than 25 cubic yards below the plane of the ordinary high water mark or the mean high water mark from navigable waters of the US (i.e., Section 10 waters) as part of a single and complete project. This NWP does not authorize the dredging or degradation through siltation of coral reefs, sites that support submerged aquatic vegetation (including sites where submerged aquatic vegetation is documented to exist, but may not be present in a given year), anadromous fish spawning areas, or wetlands, or the connection of canals or other artificial waterways to navigable waters of the US (see 33 CFR 322.5(g)). (Sections 10 and 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Limitations and Conditions:

- 1) This Nationwide Permit shall not authorize dredging in stream riffles as defined in 40 CFR 230.45.
- 2) This Nationwide Permit shall not authorize dredging in surface waters that contain contaminated sediments. The applicant shall contact Ohio EPA for a determination whether particular surface water contains contaminated sediments.

20. Oil Spill Cleanup. Activities required for the containment and cleanup of oil and hazardous substances which are subject to the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR part 300) provided that the work is done in accordance with the Spill Control and Countermeasure Plan required by 40 CFR 112.3 and any existing state contingency plan and provided that the Regional Response Team (if one exists in the area) concurs with the proposed containment and cleanup action. (Sections 10 and 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

21. Surface Coal Mining Activities. Discharges of dredged or fill material into waters of the US associated with surface coal mining and reclamation operations provided the coal mining activities are authorized by the DOI, Office of Surface Mining (OSM), or by states with approved programs under Title V of the Surface Mining Control and Reclamation Act of 1977 and provided the permittee notifies the District Engineer in accordance with the "Notification"

General Condition. In addition, to be authorized by this NWP, the District Engineer must determine that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are minimal both individually and cumulatively and must notify the project sponsor of this determination in writing. The Corps, at the discretion of the District Engineer, may require a bond to ensure success of the mitigation, if no other Federal or state agency has required one. For discharges in special aquatic sites, including wetlands, and stream riffle and pool complexes, the notification must also include a delineation of affected special aquatic sites, including wetlands. (also, see 33 CFR 330.1(e))

Mitigation: In determining the need for as well as the level and type of mitigation, the District Engineer will ensure no more than minimal adverse effects to the aquatic environment occur. As such, District Engineers will determine on a case-by-case basis the requirement for adequate mitigation to ensure the effects to aquatic systems are minimal. In cases where OSM or the state has required mitigation for the loss of aquatic habitat, the Corps may consider this in determining appropriate mitigation under Section 404.
(Sections 10 and 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Limitations and Conditions:

Water quality certification is provided for stream and wetland impacts to the following thresholds for surface coal mining, including mining within previously mined areas, conducted under a permit issued by the Ohio Department of Natural Resources, Division of Mineral Resources Management (DMRM) that incorporates the standards of the federal Surface Mining Control and Reclamation Act, and including activities conducted under contracts to reclaim forfeited coal mining operations or abandoned mine land areas. This certification would allow a maximum extent of 3,000 linear feet of total impacts to intermittent and perennial streams, and impacts to certain wetland acreages as qualified below:

- 1) For natural stream reaches, the aggregate total of impacts to intermittent and/or perennial streams authorized under Nationwide Permit (NWP) 21 shall not exceed 1,500 linear feet with no more than 500 linear feet of impacts permitted to undesignated perennial streams.
- 2) No impacts to streams designated as Warmwater Habitat or having an equivalent or higher designation, as set forth in OAC rule 3745-1-07 through 32, are permitted under NWP 21. Projects that impact streams designated Warmwater Habitat or with an equivalent or higher designation require individual 401 water quality certification.
- 3) Impacts to an additional 1,500 linear feet of streams impacted by previous mining may be authorized by this certification.
- 4) Total perennial, intermittent and ephemeral stream length and Qualitative Habitat Evaluation Index (or equivalent) data in a form prescribed by Ohio EPA and including a copy of the mining permit map showing the ephemeral, intermittent, and perennial sections of each stream shall be provided to Ohio EPA both prior to any impacts and five years following stream reconstruction.

- 5) Impacts to any waterways with a slope greater than 2% authorized under NWP 21 shall be reclaimed and/or reconstructed using natural stream channel design standards identified in the ODNR/DMRM-Ohio EPA Joint Stream Reconstruction Guidelines, when appropriate. The reclamation of streams with less than 2% slope will be completed using natural channel design techniques.
- 6) A maximum of 3 acres of total wetland impacts would be allowable under this NWP 21, with:
 - a. No more than 3 acres of impacts to Category 1 wetlands permitted.
 - b. No more than ½ acre of impacts to Category 2 wetlands permitted.
 - c. No impacts to Category 3 wetlands permitted.
 - d. Wetland mitigation shall be provided in accordance with Ohio EPA's wetland water quality standards (OAC rule 3745-1-50 through 54).

22. Removal of Vessels. Temporary structures or minor discharges of dredged or fill material required for the removal of wrecked, abandoned, or disabled vessels, or the removal of man-made obstructions to navigation. This NWP does not authorize the removal of vessels listed or determined eligible for listing on the National Register of Historic Places unless the District Engineer is notified and indicates that there is compliance with the "Historic Properties" General Condition. This NWP does not authorize maintenance dredging, shoal removal, or riverbank snagging. Vessel disposal in waters of the US may need a permit from EPA (see 40 CFR 229.3).
(Sections 10 and 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

23. Approved Categorical Exclusions. Activities undertaken, assisted, authorized, regulated, funded, or financed, in whole or in part, by another Federal agency or department where that agency or department has determined, pursuant to the Council on Environmental Quality Regulation for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA) (40 CFR part 1500 et seq.), that the activity, work, or discharge is categorically excluded from environmental documentation, because it is included within a category of actions which neither individually nor cumulatively have a significant effect on the human environment, and the Office of the Chief of Engineers (ATTN: CECW-OR) has been furnished notice of the agency's or department's application for the categorical exclusion and concurs with that determination. Before approval for purposes of this NWP of any agency's categorical exclusions, the Chief of Engineers will solicit public comment. In addressing these comments, the Chief of Engineers may require certain conditions for authorization of an agency's categorical exclusions under this NWP.
(Sections 10 and 404)

Nationwide 23 Specific Regional Conditions

- Notification is required for use of this Nationwide permit.
- Notification should also include a copy of the CE determination; delineation of special aquatic sites, and a mitigation plan for impacts greater than 1/10 acre of waters of the United States.

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

This Nationwide Permit shall only authorize activities described in 23 CFR Part 771.117 of the Federal Highway regulations.

24. State Administered Section 404 Program. Any activity permitted by a state administering its own Section 404 permit program pursuant to 33 U.S.C. 1344(g)-(l) is permitted pursuant to Section 10 of the Rivers and Harbors Act of 1899. Those activities that do not involve a Section 404 state permit are not included in this NWP, but certain structures will be exempted by Section 154 of Pub. L. 94-587, 90 Stat. 2917 (33 U.S.C. 591) (see 33 CFR 322.3(a)(2)).
(Section 10)

Not Applicable.

25. Structural Discharges. Discharges of material such as concrete, sand, rock, etc., into tightly sealed forms or cells where the material will be used as a structural member for standard pile supported structures, such as bridges, transmission line footings, and walkways or for general navigation, such as mooring cells, including the excavation of bottom material from within the form prior to the discharge of concrete, sand, rock, etc. This NWP does not authorize filled structural members that would support buildings, building pads, homes, house pads, parking areas, storage areas and other such structures. The structure itself may require a Section 10 permit if located in navigable waters of the US.
(Section 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

26. [Reserved]

27. Stream and Wetland Restoration Activities. Activities in waters of the US associated with the restoration of former waters, the enhancement of degraded tidal and non-tidal wetlands and riparian areas, the creation of tidal and non-tidal wetlands and riparian areas, and the restoration and enhancement of non-tidal streams and non-tidal open water areas as follows:

(a) The activity is conducted on:

- (1) Non-Federal public lands and private lands, in accordance with the terms and conditions of a binding wetland enhancement, restoration, or creation agreement between the landowner and the U.S. Fish and Wildlife Service (FWS) or the

Natural Resources Conservation Service (NRCS), the National Marine Fisheries Service, the National Ocean Service, or voluntary wetland restoration, enhancement, and creation actions documented by the NRCS pursuant to NRCS regulations; or

(2) Reclaimed surface coal mine lands, in accordance with a Surface Mining Control and Reclamation Act permit issued by the OSM or the applicable state agency (the future reversion does not apply to streams or wetlands created, restored, or enhanced as mitigation for the mining impacts, nor naturally due to hydrologic or topographic features, nor for a mitigation bank); or

(3) Any other public, private or tribal lands;

(b) Notification: For activities on any public or private land that are not described by paragraphs (a)(1) or (a)(2) above, the permittee must notify the District Engineer in accordance with General Condition 13; and

(c) Planting of only native species should occur on the site.

Activities authorized by this NWP include, to the extent that a Corps permit is required, but are not limited to: the removal of accumulated sediments; the installation, removal, and maintenance of small water control structures, dikes, and berms; the installation of current deflectors; the enhancement, restoration, or creation of riffle and pool stream structure; the placement of in-stream habitat structures; modifications of the stream bed and/or banks to restore or create stream meanders; the backfilling of artificial channels and drainage ditches; the removal of existing drainage structures; the construction of small nesting islands; the construction of open water areas; the construction of oyster habitat over unvegetated bottom in tidal waters; activities needed to reestablish vegetation, including plowing or disking for seed bed preparation and the planting of appropriate wetland species; mechanized land clearing to remove non-native invasive, exotic or nuisance vegetation; and other related activities.

This NWP does not authorize the conversion of a stream to another aquatic use, such as the creation of an impoundment for waterfowl habitat. This NWP does not authorize stream channelization. This NWP does not authorize the conversion of natural wetlands to another aquatic use, such as creation of waterfowl impoundments where a forested wetland previously existed. However, this NWP authorizes the relocation of non-tidal waters, including non-tidal wetlands, on the project site provided there are net gains in aquatic resource functions and values. For example, this NWP may authorize the creation of an open water impoundment in a non-tidal emergent wetland, provided the non-tidal emergent wetland is replaced by creating that wetland type on the project site. This NWP does not authorize the relocation of tidal waters or the conversion of tidal waters, including tidal wetlands, to other aquatic uses, such as the conversion of tidal wetlands into open water impoundments.

Reversion. For enhancement, restoration, and creation projects conducted under paragraphs (a)(3), this NWP does not authorize any future discharge of dredged or fill material associated with the reversion of the area to its prior condition. In such cases a separate permit would be required for any reversion. For restoration, enhancement, and creation projects conducted under paragraphs (a)(1) and (a)(2), this NWP also authorizes any future discharge of dredged or fill material associated with the reversion of the area to its documented prior condition and use (i.e., prior to the restoration, enhancement, or creation activities). The

reversion must occur within five years after expiration of a limited term wetland restoration or creation agreement or permit, even if the discharge occurs after this NWP expires. This NWP also authorizes the reversion of wetlands that were restored, enhanced, or created on prior-converted cropland that has not been abandoned, in accordance with a binding agreement between the landowner and NRCS or FWS (even though the restoration, enhancement, or creation activity did not require a Section 404 permit). The five-year reversion limit does not apply to agreements without time limits reached under paragraph (a)(1). The prior condition will be documented in the original agreement or permit, and the determination of return to prior conditions will be made by the Federal agency or appropriate state agency executing the agreement or permit. Before any reversion activity the permittee or the appropriate Federal or state agency must notify the District Engineer and include the documentation of the prior condition. Once an area has reverted to its prior physical condition, it will be subject to whatever the Corps Regulatory requirements will be at that future date.
(Sections 10 and 404)

Note: Compensatory mitigation is not required for activities authorized by this NWP, provided the authorized work results in a net increase in aquatic resource functions and values in the project area. This NWP can be used to authorize compensatory mitigation projects, including mitigation banks, provided the permittee notifies the District Engineer in accordance with General Condition 13, and the project includes compensatory mitigation for impacts to waters of the US caused by the authorized work. However, this NWP does not authorize the reversion of an area used for a compensatory mitigation project to its prior condition. NWP 27 can be used to authorize impacts at a mitigation bank, but only in circumstances where it has been approved under the Interagency Federal Mitigation Bank Guidelines.

Nationwide 27 Specific Regional Condition

- Notification is required for all work in waters of the U.S., including special aquatic sites.

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations: This Certification does not authorize impacts to more than ½ acre of Category 2 forested wetlands unless Ohio EPA is a signatory to a Mitigation Banking Review Team (MBRT) instrument which addresses the impact.

28. Modifications of Existing Marinas. Reconfiguration of existing docking facilities within an authorized marina area. No dredging, additional slips, dock spaces, or expansion of any kind within waters of the US is authorized by this NWP.
(Section 10)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

29. Single-family Housing. Discharges of dredged or fill material into non-tidal waters of the US, including non-tidal wetlands for the construction or expansion of a single-family

home and attendant features (such as a garage, driveway, storage shed, and/or septic field) for an Individual Permittee provided that the activity meets all of the following criteria:

- a. The discharge does not cause the loss of more than 1/4-acre of non-tidal waters of the US, including non-tidal wetlands;
- b. The permittee notifies the District Engineer in accordance with the "Notification" General Condition;
- c. The permittee has taken all practicable actions to minimize the on-site and off-site impacts of the discharge. For example, the location of the home may need to be adjusted on-site to avoid flooding of adjacent property owners;
- d. The discharge is part of a single and complete project; furthermore, that for any subdivision created on or after November 22, 1991, the discharges authorized under this NWP may not exceed an aggregate total loss of waters of the US of 1/4-acre for the entire subdivision;
- e. An individual may use this NWP only for a single-family home for a personal residence;
- f. This NWP may be used only once per parcel;
- g. This NWP may not be used in conjunction with NWP 14 or NWP 18, for any parcel; and,
- h. Sufficient vegetated buffers must be maintained adjacent to all open water bodies, streams, etc., to preclude water quality degradation due to erosion and sedimentation.

For the purposes of this NWP, the acreage of loss of waters of the US includes the filled area previously permitted, the proposed filled area, and any other waters of the US that are adversely affected by flooding, excavation, or drainage as a result of the project. This NWP authorizes activities only by individuals; for this purpose, the term "individual" refers to a natural person and/or a married couple, but does not include a corporation, partnership, or similar entity. For the purposes of this NWP, a parcel of land is defined as "the entire contiguous quantity of land in possession of, recorded as property of, or owned (in any form of ownership, including land owned as a partner, corporation, joint tenant, etc.) by the same individual (and/or that individual's spouse), and comprises not only the area of wetlands sought to be filled, but also all land contiguous to those wetlands, owned by the individual (and/or that individual's spouse) in any form of ownership."

(Sections 10 and 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

30. Moist Soil Management for Wildlife. Discharges of dredged or fill material and maintenance activities that are associated with moist soil management for wildlife performed on non-tidal Federally-owned or managed, state-owned or managed property, and local government agency-owned or managed property, for the purpose of continuing ongoing, site-specific, wildlife management activities where soil manipulation is used to manage habitat and feeding areas for wildlife. Such activities include, but are not limited to: The repair, maintenance or replacement of existing water control structures; the repair or maintenance of dikes; and plowing or disking to impede succession, prepare seed beds, or establish fire breaks. Sufficient vegetated buffers must be maintained adjacent to all open water bodies, streams, etc., to preclude water

quality degradation due to erosion and sedimentation. This NWP does not authorize the construction of new dikes, roads, water control structures, etc. associated with the management areas. This NWP does not authorize converting wetlands to uplands, impoundments or other open water bodies.

Section 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

31. Maintenance of Existing Flood Control Facilities. Discharge of dredge or fill material resulting from activities associated with the maintenance of existing flood control facilities, including debris basins, retention/detention basins, and channels that

(i) were previously authorized by the Corps by Individual Permit, General Permit, by 33 CFR 330.3, or did not require a permit at the time it was constructed, or

(ii) were constructed by the Corps and transferred to a non-Federal sponsor for operation and maintenance. Activities authorized by this NWP are limited to those resulting from maintenance activities that are conducted within the "maintenance baseline," as described in the definition below. Activities including the discharges of dredged or fill materials, associated with maintenance activities in flood control facilities in any watercourse that has previously been determined to be within the maintenance baseline, are authorized under this NWP. The NWP does not authorize the removal of sediment and associated vegetation from the natural water courses except to the extent that these have been included in the maintenance baseline. All dredged material must be placed in an upland site or an authorized disposal site in waters of the US, and proper siltation controls must be used. (Activities of any kind that result in only incidental fallback, or only the cutting and removing of vegetation above the ground, e.g., mowing, rotary cutting, and chainsawing, where the activity neither substantially disturbs the root system nor involves mechanized pushing, dragging, or other similar activities that redeposit excavated soil material, do not require a Section 404 permit in accordance with 33 CFR 323.2(d)(2)).

Notification: After the maintenance baseline is established, and before any maintenance work is conducted, the permittee must notify the District Engineer in accordance with the "Notification" General Condition. The notification may be for activity-specific maintenance or for maintenance of the entire flood control facility by submitting a five year (or less) maintenance plan.

Maintenance Baseline: The maintenance baseline is a description of the physical characteristics (e.g., depth, width, length, location, configuration, or design flood capacity, etc.) of a flood control project within which maintenance activities are normally authorized by NWP 31, subject to any case-specific conditions required by the District Engineer. The District Engineer will approve the maintenance baseline based on the approved or constructed capacity of the flood control facility, whichever is smaller, including any areas where there are no constructed channels, but which are part of the facility. If no evidence of the constructed capacity exist, the approved constructed capacity will be used. The prospective permittee will provide documentation of the physical characteristics of the flood control facility (which will normally consist of as-built or approved drawings) and documentation of the design capacities of the flood control facility. The documentation will also include BMPs to ensure that the impacts to the

aquatic environment are minimal, especially in maintenance areas where there are no constructed channels. (The Corps may request maintenance records in areas where there has not been recent maintenance.) Revocation or modification of the final determination of the maintenance baseline can only be done in accordance with 33 CFR 330.5. Except in emergencies as described below, this NWP can not be used until the District Engineer approves the maintenance baseline and determines the need for mitigation and any regional or activity-specific conditions. Once determined, the maintenance baseline will remain valid for any subsequent reissuance of this NWP. This permit does not authorize maintenance of a flood control facility that has been abandoned. A flood control facility will be considered abandoned if it has operated at a significantly reduced capacity without needed maintenance being accomplished in a timely manner.

Mitigation: The District Engineer will determine any required mitigation one-time only for impacts associated with maintenance work at the same time that the maintenance baseline is approved. Such one-time mitigation will be required when necessary to ensure that adverse environmental impacts are no more than minimal, both individually and cumulatively. Such mitigation will only be required once for any specific reach of a flood control project. However, if one-time mitigation is required for impacts associated with maintenance activities, the District Engineer will not delay needed maintenance, provided the District Engineer and the permittee establish a schedule for identification, approval, development, construction and completion of any such required mitigation. Once the one-time mitigation described above has been completed, or a determination made that mitigation is not required, no further mitigation will be required for maintenance activities within the maintenance baseline. In determining appropriate mitigation, the District Engineer will give special consideration to natural water courses that have been included in the maintenance baseline and require compensatory mitigation and/or BMPs as appropriate.

Emergency Situations: In emergency situations, this NWP may be used to authorize maintenance activities in flood control facilities for which no maintenance baseline has been approved. Emergency situations are those which would result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship if action is not taken before a maintenance baseline can be approved. In such situations, the determination of mitigation requirements, if any, may be deferred until the emergency has been resolved. Once the emergency has ended, a maintenance baseline must be established expeditiously, and mitigation, including mitigation for maintenance conducted during the emergency, must be required as appropriate.

(Sections 10 and 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations: This Nationwide Permit shall only authorize projects constructed by the Corps of Engineers and maintained by the Corps or transferred by the Corps to a local sponsor.

32. Completed Enforcement Actions. Any structure, work or discharge of dredged or fill material, remaining in place, or undertaken for mitigation, restoration, or environmental benefit in compliance with either:

(i) The terms of a final written Corps non-judicial settlement agreement resolving a violation of section 404 of the CWA and/or section 10 of the Rivers and Harbors Act of 1899; or the terms of an EPA 309(a) order on consent resolving a violation of section 404 of the CWA, provided that:

- a. The unauthorized activity affected no more than 5 acres of non-tidal wetlands or 1 acre of tidal wetlands;
- b. The settlement agreement provides for environmental benefits, to an equal or greater degree, than the environmental detriments caused by the unauthorized activity that is authorized by this NWP; and
- c. The District Engineer issues a verification letter authorizing the activity subject to the terms and conditions of this NWP and the settlement agreement, including a specified completion date; or

(ii) The terms of a final Federal court decision, consent decree, or settlement agreement resulting from an enforcement action brought by the U.S. under Section 404 of the CWA and/or Section 10 of the Rivers and Harbors Act of 1899; or

(iii) The terms of a final court decision, consent decree, settlement agreement, or non-judicial settlement agreement resulting from a natural resource damage claim brought by a trustee or trustees for natural resources (as defined by the National Contingency Plan at 40 CFR subpart G) under Section 311 of the Clean Water Act (CWA), Section 107 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund), Section 312 of the National Marine Sanctuaries Act (NMSA), Section 1002 of the Oil Pollution Act of 1990 (OPA), or the Park System Resource Protection Act at 16 U.S.C. '19jj, to the extent that a Corps permit is required.

For either (i), (ii) or (iii) above, compliance is a condition of the NWP itself. Any authorization under this NWP is automatically revoked if the permittee does not comply with the terms of this NWP or the terms of the court decision, consent decree, or judicial/non-judicial settlement agreement or fails to complete the work by the specified completion date. This NWP does not apply to any activities occurring after the date of the decision, decree, or agreement that are not for the purpose of mitigation, restoration, or environmental benefit. Before reaching any settlement agreement, the Corps will ensure compliance with the provisions of 33 CFR part 326 and 33 CFR 330.6 (d)(2) and (e).

(Sections 10 and 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Limitations and Conditions:

- 1) This Nationwide Permit shall not authorize any project with greater than 3 acres of wetland impacts, or impacts over 500 linear feet in any stream unless Ohio EPA has been informed in writing of each specific project that exceeds these criteria, and based on this information, has chosen not to issue a State Administrative Order, or Consent Order resulting from a State enforcement action.

- 2) The Corps of Engineers shall provide notification to Ohio EPA prior to any settlement agreement being finalized. The Corps shall provide such notification with a copy of the draft settlement document for Ohio EPA's review and comment. Ohio EPA will provide notice to the Corps that it intends to provide substantive site-specific comments within 5 days of the receipt of the draft settlement document. Ohio EPA will provide these comments to the Corps within 16 days of the receipt of the draft document. The Corps shall fully consider Ohio EPA's comments prior to finalizing the settlement document, and provide Ohio EPA with a copy of the final settlement agreement

33. Temporary Construction, Access and Dewatering. Temporary structures, work and discharges, including cofferdams, necessary for construction activities or access fills or dewatering of construction sites; provided that the associated primary activity is authorized by the Corps of Engineers or the USCG, or for other construction activities not subject to the Corps or USCG regulations. Appropriate measures must be taken to maintain near normal downstream flows and to minimize flooding. Fill must be of materials, and placed in a manner, that will not be eroded by expected high flows. The use of dredged material may be allowed if it is determined by the District Engineer that it will not cause more than minimal adverse effects on aquatic resources.

Temporary fill must be entirely removed to upland areas, or dredged material returned to its original location, following completion of the construction activity, and the affected areas must be restored to the pre-project conditions. Cofferdams cannot be used to dewater wetlands or other aquatic areas to change their use. Structures left in place after cofferdams are removed require a Section 10 permit if located in navigable waters of the U.S. (See 33 CFR part 322). The permittee must notify the District Engineer in accordance with the "Notification" General Condition. The notification must also include a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic resources. The District Engineer will add Special Conditions, where necessary, to ensure environmental adverse effects is minimal. Such conditions may include: limiting the temporary work to the minimum necessary; requiring seasonal restrictions; modifying the restoration plan; and requiring alternative construction methods (e.g. construction mats in wetlands where practicable.).
(Sections 10 and 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Limitations and Conditions:

- 1) Temporary shall be defined as less than one year in duration;
- 2) This Nationwide Permit does not authorize construction, or maintenance, or modification of marina basins;
- 3) This Nationwide Permit does not authorize activities in special aquatic sites as defined in 40 CFR 230.3(q-1);

- 4) This Nationwide Permit shall not authorize temporary construction access and dewatering associated with mining activities.

34. *Cranberry Production Activities.* Discharges of dredged or fill material for dikes, berms, pumps, water control structures or leveling of cranberry beds associated with expansion, enhancement, or modification activities at existing cranberry production operations provided that the activity meets all of the following criteria:

- a. The cumulative total acreage of disturbance per cranberry production operation, including but not limited to, filling, flooding, ditching, or clearing, does not exceed 10 acres of waters of the U.S., including wetlands;
- b. The permittee notifies the District Engineer in accordance with the "Notification" General Condition. The notification must include a delineation of affected special aquatic sites, including wetlands; and,
- c. The activity does not result in a net loss of wetland acreage.

This NWP does not authorize any discharge of dredged or fill material related to other cranberry production activities such as warehouses, processing facilities, or parking areas. For the purposes of this NWP, the cumulative total of 10 acres will be measured over the period that this NWP is valid.

(Section 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

35. *Maintenance Dredging of Existing Basins.* Excavation and removal of accumulated sediment for maintenance of existing marina basins, access channels to marinas or boat slips, and boat slips to previously authorized depths or controlling depths for ingress/egress, whichever is less, provided the dredged material is disposed of at an upland site and proper siltation controls are used.

(Section 10)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

36. *Boat Ramps.* Activities required for the construction of boat ramps provided:

- a. The discharge into waters of the U.S. does not exceed 50 cubic yards of concrete, rock, crushed stone or gravel into forms, or placement of pre-cast concrete planks or slabs. (Unsuitable material that causes unacceptable chemical pollution or is structurally unstable is not authorized);
- b. The boat ramp does not exceed 20 feet in width;
- c. The base material is crushed stone, gravel or other suitable material;
- d. The excavation is limited to the area necessary for site preparation and all excavated material is removed to the upland; and,
- e. No material is placed in special aquatic sites, including wetlands.

Dredging to provide access to the boat ramp may be authorized by another NWP, Regional General Permit, or Individual Permit pursuant to Section 10 if located in navigable waters of the United States.

(Sections 10 and 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations: This Nationwide Permit shall not authorize boat ramps where dredging is required to establish water depths necessary for boat launching.

37. *Emergency Watershed Protection and Rehabilitation.* Work done by or funded by:

- a. The NRCS which is a situation requiring immediate action under its emergency Watershed Protection Program (7 CFR part 624); or
- b. The USFS under its Burned-Area Emergency Rehabilitation Handbook (FSH 509.13); or
- c. The DOI for wildland fire management burned area emergency stabilization and rehabilitation (DOI Manual part 620, Ch. 3).

For all of the above provisions, the District Engineer must be notified in accordance with the General Condition 13. (Also, see 33 CFR 330.1(e)).

(Sections 10 and 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

38. *Cleanup of Hazardous and Toxic Waste.* Specific activities required to effect the containment, stabilization, or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority provided the permittee notifies the District Engineer in accordance with the "Notification" General Condition. For discharges in special aquatic sites, including wetlands, the notification must also include a delineation of affected special aquatic sites, including wetlands. Court ordered remedial action plans or related settlements are also authorized by this NWP. This NWP does not authorize the establishment of new disposal sites or the expansion of existing sites used for the disposal of hazardous or toxic waste. Activities undertaken entirely on a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site by authority of CERCLA as approved or required by EPA, are not required to obtain permits under Section 404 of the CWA or Section 10 of the Rivers and Harbors Act.

(Sections 10 and 404)

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

39. *Residential, Commercial, and Institutional Developments.* Discharges of dredged or fill material into non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal

waters, for the construction or expansion of residential, commercial, and institutional building foundations and building pads and attendant features that are necessary for the use and maintenance of the structures. Attendant features may include, but are not limited to, roads, parking lots, garages, yards, utility lines, stormwater management facilities, and recreation facilities such as playgrounds, playing fields, and golf courses (provided the golf course is an integral part of the residential development). The construction of new ski areas or oil and gas wells is not authorized by this NWP. Residential developments include multiple and single unit developments. Examples of commercial developments include retail stores, industrial facilities, restaurants, business parks, and shopping centers. Examples of institutional developments include schools, fire stations, government office buildings, judicial buildings, public works buildings, libraries, hospitals, and places of worship. The activities listed above are authorized, provided the activities meet all of the following criteria:

- a. The discharge does not cause the loss of greater than 1/2-acre of non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal waters;
- b. The discharge does not cause the loss of greater than 300 linear-feet of a stream bed, unless for intermittent stream beds this criterion is waived in writing pursuant to a determination by the District Engineer, as specified below, that the project complies with all terms and conditions of this NWP and that any adverse impacts of the project on the aquatic environment are minimal, both individually and cumulatively;
- c. The permittee must notify the District Engineer in accordance with General Condition 13, if any of the following criteria are met:
 - (1) The discharge causes the loss of greater than 1/10-acre of non-tidal waters of the US, excluding non-tidal wetlands adjacent to tidal waters; or
 - (2) The discharge causes the loss of any open waters, including perennial or intermittent streams, below the ordinary high water mark (see Note, below); or
 - (3) The discharge causes the loss of greater than 300 linear feet of intermittent stream bed. In such case, to be authorized the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts in writing before the permittee may proceed;
- d. For discharges in special aquatic sites, including wetlands, the notification must include a delineation of affected special aquatic sites;
- e. The discharge is part of a single and complete project;
- f. The permittee must avoid and minimize discharges into waters of the US at the project site to the maximum extent practicable. The notification, when required, must include a written statement explaining how avoidance and minimization of losses of waters of the US were achieved on the project site. Compensatory mitigation will normally be required to offset the losses of waters of the US. (See General Condition 19.) The notification must also include a compensatory mitigation proposal for offsetting unavoidable losses of waters of the US. If an applicant asserts that the adverse effects of the project are minimal without mitigation, then the applicant may submit justification explaining why compensatory mitigation should not be required for the District Engineer's consideration;

- g. When this NWP is used in conjunction with any other NWP, any combined total permanent loss of waters of the US exceeding 1/10-acre requires that the permittee notify the District Engineer in accordance with General Condition 13;
- h. Any work authorized by this NWP must not cause more than minimal degradation of water quality or more than minimal changes to the flow characteristics of any stream (see General Conditions 9 and 21);
- i. For discharges causing the loss of 1/10-acre or less of waters of the US, the permittee must submit a report, within 30 days of completion of the work, to the District Engineer that contains the following information: (1) The name, address, and telephone number of the permittee; (2) The location of the work; (3) A description of the work; (4) The type and acreage of the loss of waters of the US (e.g., 1/12-acre of emergent wetlands); and (5) The type and acreage of any compensatory mitigation used to offset the loss of waters of the US (e.g., 1/12-acre of emergent wetlands created on-site);
- j. If there are any open waters or streams within the project area, the permittee will establish and maintain, to the maximum extent practicable, wetland or upland vegetated buffers next to those open waters or streams consistent with General Condition 19. Deed restrictions, conservation easements, protective covenants, or other means of land conservation and preservation are required to protect and maintain the vegetated buffers established on the project site.

Only residential, commercial, and institutional activities with structures on the foundation(s) or building pad(s), as well as the attendant features, are authorized by this NWP. The compensatory mitigation proposal that is required in paragraph (f) of this NWP may be either conceptual or detailed. The wetland or upland vegetated buffer required in paragraph (j) of this NWP will be determined on a case-by-case basis by the District Engineer for addressing water quality concerns. The required wetland or upland vegetated buffer is part of the overall compensatory mitigation requirement for this NWP.

If the project site was previously used for agricultural purposes and the farm owner/operator used NWP 40 to authorize activities in waters of the US to increase production or construct farm buildings, NWP 39 cannot be used by the developer to authorize additional activities in waters of the United States on the project site in excess of the acreage limit for NWP 39 (i.e., the combined acreage loss authorized under NWPs 39 and 40 cannot exceed 1/2-acre).

Subdivisions: For residential subdivisions, the aggregate total loss of waters of US authorized by NWP 39 can not exceed 1/2-acre. This includes any loss of waters associated with development of individual subdivision lots.

(Sections 10 and 404)

Note: Areas where wetland vegetation is not present should be determined by the presence or absence of an ordinary high water mark or bed and bank. Areas that are waters of the US based on this criterion would require a PCN although water is infrequently present in the stream channel (except for ephemeral waters, which do not require PCNs).

Nationwide 39 Specific Regional Conditions

- Notification is required for all impacts to Section 10 waters and wetlands adjacent to Section 10 waters.
- Notification is required for all perennial and intermittent stream impacts.
- Notification is required for ephemeral stream impacts greater than 300 linear feet.

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

40. *Agricultural Activities.* Discharges of dredged or fill material into non-tidal waters of the US, excluding non-tidal wetlands adjacent to tidal waters, for improving agricultural production and the construction of building pads for farm buildings. Authorized activities include the installation, placement, or construction of drainage tiles, ditches, or levees; mechanized land clearing; land leveling; the relocation of existing serviceable drainage ditches constructed in waters of the US; and similar activities, provided the permittee complies with the following terms and conditions:

a. For discharges into non-tidal wetlands to improve agricultural production, the following criteria must be met if the permittee is an United States Department of Agriculture (USDA) Program participant:

- (1) The permittee must obtain a categorical minimal effects exemption, minimal effect exemption, or mitigation exemption from NRCS in accordance with the provisions of the Food Security Act of 1985, as amended (16 U.S.C. 3801 et seq.);
- (2) The discharge into non-tidal wetlands does not result in the loss of greater than 1/2-acre of non-tidal wetlands on a farm tract;
- (3) The permittee must have NRCS-certified wetland delineation;
- (4) The permittee must implement an NRCS-approved compensatory mitigation plan that fully offsets wetland losses, if required; and
- (5) The permittee must submit a report, within 30 days of completion of the authorized work, to the District Engineer that contains the following information:
(a) The name, address, and telephone number of the permittee; (b) The location of the work; (c) A description of the work; (d) The type and acreage (or square feet) of the loss of wetlands (e.g., 1/3-acre of emergent wetlands); and (e) The type, acreage (or square feet), and location of compensatory mitigation (e.g. 1/3-acre of emergent wetland on a farm tract; credits purchased from a mitigation bank); or

b. For discharges into non-tidal wetlands to improve agricultural production, the following criteria must be met if the permittee is not a USDA Program participant (or a USDA Program participant for which the proposed work does not qualify for authorization under paragraph (a) of this NWP):

- (1) The discharge into non-tidal wetlands does not result in the loss of greater than 1/2-acre of non-tidal wetlands on a farm tract;
- (2) The permittee must notify the District Engineer in accordance with General Condition 13, if the discharge results in the loss of greater than 1/10-acre of non-tidal wetlands;
- (3) The notification must include a delineation of affected wetlands; and

- (4) The notification must include a compensatory mitigation proposal to offset losses of waters of the US; or
- c. For the construction of building pads for farm buildings, the discharge does not cause the loss of greater than 1/2-acre of non-tidal wetlands that were in agricultural production prior to December 23, 1985, (i.e., farmed wetlands) and the permittee must notify the District Engineer in accordance with General Condition 13; and
- d. Any activity in other waters of the US is limited to the relocation of existing serviceable drainage ditches constructed in non-tidal streams. This NWP does not authorize the relocation of greater than 300 linear-feet of existing serviceable drainage ditches constructed in non-tidal streams unless, for drainage ditches constructed in intermittent non-tidal streams, the District Engineer waives this criterion in writing, and the District Engineer has determined that the project complies with all terms and conditions of this NWP, and that any adverse impacts of the project on the aquatic environment are minimal, both individually and cumulatively. For impacts exceeding 300-linear feet of impacts to existing serviceable ditches constructed in intermittent non-tidal streams, the permittee must notify the District Engineer in accordance with the "Notification" General Condition 13.

The term "farm tract" refers to a parcel of land identified by the Farm Service Agency. The Corps will identify other waters of the US on the farm tract. NRCS will determine if a proposed agricultural activity meets the terms and conditions of paragraph a. of this NWP, except as provided below. For those activities that require notification, the District Engineer will determine if a proposed agricultural activity is authorized by paragraphs b., c., and/or d. of this NWP. USDA Program participants requesting authorization for discharges of dredged or fill material into waters of the US authorized by paragraphs (c) or (d) of this NWP, in addition to paragraph (a), must notify the District Engineer in accordance with General Condition 13 and the District Engineer will determine if the entire single and complete project is authorized by this NWP. Discharges of dredged or fill material into waters of the US associated with completing required compensatory mitigation are authorized by this NWP. However, total impacts, including other authorized impacts under this NWP, may not exceed the 1/2-acre limit of this NWP. This NWP does not affect, or otherwise regulate, discharges associated with agricultural activities when the discharge qualifies for an exemption under Section 404(f) of the CWA, even though a categorical minimal effects exemption, minimal effect exemption, or mitigation exemption from NRCS pursuant to the Food Security Act of 1985, as amended, may be required. Activities authorized by paragraphs a. through d. may not exceed a total of 1/2-acre on a single farm tract. If the site was used for agricultural purposes and the farm owner/operator used either paragraphs a., b., or c. of this NWP to authorize activities in waters of the US to increase agricultural production or construct farm buildings, and the current landowner wants to use NWP 39 to authorize residential, commercial, or industrial development activities in waters of the US on the site, the combined acreage loss authorized by NWPs 39 and 40 cannot exceed 1/2-acre (see General Condition 15).

(Section 404)

Nationwide 40 Specific Regional Conditions

- Notification is required for all perennial stream impacts.

- Notification is required for all intermittent stream impacts greater than 200 linear feet and all ephemeral stream impacts greater than 300 linear feet.

Note: These regional conditions apply to non-USDA program participants.

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations: This Certification shall be used only once per farm. For the purposes of this condition, farm shall be defined to include all individual farm tracts, whether or not such tracts are contiguous, that are owned by the applicant.

41. Reshaping Existing Drainage Ditches. Discharges of dredged or fill material into non-tidal waters of the US, excluding non-tidal wetlands adjacent to tidal waters, to modify the cross-sectional configuration of currently serviceable drainage ditches constructed in waters of the US. The reshaping of the ditch cannot increase drainage capacity beyond the original design capacity. Nor can it expand the area drained by the ditch as originally designed (i.e., the capacity of the ditch must be the same as originally designed and it cannot drain additional wetlands or other waters of the US). Compensatory mitigation is not required because the work is designed to improve water quality (e.g., by regrading the drainage ditch with gentler slopes, which can reduce erosion, increase growth of vegetation, increase uptake of nutrients and other substances by vegetation, etc.).

Notification: The permittee must notify the District Engineer in accordance with General Condition 13 if greater than 500 linear feet of drainage ditch will be reshaped. Material resulting from excavation may not be permanently sidecast into waters but may be temporarily sidecast (up to three months) into waters of the US, provided the material is not placed in such a manner that it is dispersed by currents or other forces. The District Engineer may extend the period of temporary sidecasting not to exceed a total of 180 days, where appropriate. In general, this NWP does not apply to reshaping drainage ditches constructed in uplands, since these areas are generally not waters of the US, and thus no permit from the Corps is required, or to the maintenance of existing drainage ditches to their original dimensions and configuration, which does not require a Section 404 permit (see 33 CFR 323.4(a)(3)). This NWP does not authorize the relocation of drainage ditches constructed in waters of the US; the location of the centerline of the reshaped drainage ditch must be approximately the same as the location of the centerline of the original drainage ditch. This NWP does not authorize stream channelization or stream relocation projects.

(Section 404)

Nationwide 41 Specific Regional Conditions

- Notification is required for all impacts

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations:

- 1) This Certification only authorizes impacts to existing maintained and channelized ephemeral water conveyances.
- 2) Reshaping of existing agricultural and roadway drainage ditches greater than 200 linear feet but less than 500 linear feet in total length that have been created or previously modified and maintained for the purpose of draining abutting existing agricultural land or existing roadways shall not require an individual Section 401 Certification if either:
 - a) The ditch was man-made and is existing; or
 - b) The stream/ditch has existing entrenchment ratios that are less than 1.4 and the proposed dredging impacts do not reduce the sinuosity of the stream/ditch channel.
- 3) Prior to the commencement of the project, all drainage ditch reshaping projects must be certified in writing by either the Natural Resources Conservation Service or Soil and Water Conservation District or County Engineer in the County where the project occurs, or by a certified professional engineer, that the project complies with the above criteria. In order to be authorized under this paragraph, such certification shall be maintained by the person or entity engaged in the project and a copy shall be sent to: Ohio EPA, Division of Surface Water, Section 401 Unit, P.O. Box 1049, Columbus, Ohio 43216-1049.

42. Recreational Facilities. Discharges of dredged or fill material into non-tidal waters of the US, excluding non-tidal wetlands adjacent to tidal waters, for the construction or expansion of recreational facilities, provided the activity meets all of the following criteria:

- a. The discharge does not cause the loss of greater than 1/2-acre of non-tidal waters of the US, excluding non-tidal wetlands adjacent to tidal waters;
- b. The discharge does not cause the loss of greater than 300 linear-feet of a stream bed, unless for intermittent stream beds this criterion is waived in writing pursuant to a determination by the District Engineer, as specified below, that the project complies with all terms and conditions of this NWP and that any adverse impacts of the project on the aquatic environment are minimal, both individually and cumulatively;
- c. The permittee notifies the District Engineer in accordance with the "Notification" General Condition 13 for discharges exceeding 300 linear feet of impact of intermittent stream beds. In such cases, to be authorized the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine the adverse environmental effects are minimal both individually and cumulatively, and waive this limitation in writing before the permittee may proceed;
- d. For discharges causing the loss of greater than 1/10-acre of non-tidal waters of the US, the permittee notifies the District Engineer in accordance with General Condition 13;
- e. For discharges in special aquatic sites, including wetlands, the notification must include a delineation of affected special aquatic sites;
- f. The discharge is part of a single and complete project; and
- g. Compensatory mitigation will normally be required to offset the losses of waters of the US. The notification must also include a compensatory mitigation proposal to offset authorized losses of waters of the US.

For the purposes of this NWP, the term "recreational facility" is defined as a recreational activity that is integrated into the natural landscape and does not substantially change preconstruction grades or deviate from natural landscape contours. For the purpose of this permit, the primary function of recreational facilities does not include the use of motor vehicles, buildings, or impervious surfaces. Examples of recreational facilities that may be authorized by this NWP include hiking trails, bike paths, horse paths, nature centers, and campgrounds (excluding trailer parks). This NWP may authorize the construction or expansion of golf courses and the expansion of ski areas, provided the golf course or ski area does not substantially deviate from natural landscape contours. Additionally, these activities are designed to minimize adverse effects to waters of the US and riparian areas through the use of such practices as integrated pest management, adequate stormwater management facilities, vegetated buffers, reduced fertilizer use, etc. The facility must have an adequate water quality management measures in accordance with General Condition 9, such as a stormwater management facility, to ensure that the recreational facility results in no substantial adverse effects to water quality. This NWP also authorizes the construction or expansion of small support facilities, such as maintenance and storage buildings and stables that are directly related to the recreational activity. This NWP does not authorize other buildings, such as hotels, restaurants, etc. The construction or expansion of playing fields (e.g., baseball, soccer, or football fields), basketball and tennis courts, racetracks, stadiums, arenas, and the construction of new ski areas are not authorized by this NWP. (Section 404)

Nationwide 42 Specific Regional Conditions

- Notification is required for all impacts to Section 10 waters and wetlands adjacent to Section 10 waters.
- Notification is required for all perennial and intermittent stream impacts.
- Notification is required for ephemeral stream impacts greater than 300 linear feet.

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations: This Certification shall not authorize the construction, modification or expansion of golf courses or ski areas.

43. Stormwater Management Facilities. Discharges of dredged or fill material into non-tidal waters of the US, excluding non-tidal wetlands adjacent to tidal waters, for the construction and maintenance of stormwater management facilities, including activities for the excavation of stormwater ponds/facilities, detention basins, and retention basins; the installation and maintenance of water control structures, outfall structures and emergency spillways; and the maintenance dredging of existing stormwater management ponds/facilities and detention and retention basins, provided the activity meets all of the following criteria:

- a. The discharge for the construction of new stormwater management facilities does not cause the loss of greater than 1/2-acre of non-tidal waters of the US, excluding non-tidal wetlands adjacent to tidal waters;
- b. The discharge does not cause the loss of greater than 300 linear-feet of a stream bed, unless for intermittent stream beds this criterion is waived in writing pursuant to a determination by the District Engineer, as specified below, that the project complies with

all terms and conditions of this NWP and that any adverse impacts of the project on the aquatic environment are minimal, both individually and cumulatively;

c. For discharges causing the loss of greater than 300 linear feet of intermittent stream beds, the permittee notifies the District Engineer in accordance with the "Notification" General Condition 13. In such cases, to be authorized the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine the adverse environmental effects are minimal both individually and cumulatively, and waive this limitation in writing before the permittee may proceed;

d. The discharges of dredged or fill material for the construction of new stormwater management facilities in perennial streams is not authorized;

e. For discharges or excavation for the construction of new stormwater management facilities or for the maintenance of existing stormwater management facilities causing the loss of greater than 1/10-acre of non-tidal waters, excluding non-tidal wetlands adjacent to tidal waters, provided the permittee notifies the District Engineer in accordance with the "Notification" General Condition 13. In addition, the notification must include:

(1) A maintenance plan. The maintenance plan should be in accordance with state and local requirements, if any such requirements exist;

(2) For discharges in special aquatic sites, including wetlands and submerged aquatic vegetation, the notification must include a delineation of affected areas; and

(3) A compensatory mitigation proposal that offsets the loss of waters of the US. Maintenance in constructed areas will not require mitigation provided such maintenance is accomplished in designated maintenance areas and not within compensatory mitigation areas (i.e., District Engineers may designate non-maintenance areas, normally at the downstream end of the stormwater management facility, in existing stormwater management facilities). (No mitigation will be required for activities that are exempt from Section 404 permit requirements);

f. The permittee must avoid and minimize discharges into waters of the US at the project site to the maximum extent practicable, and the notification must include a written statement to the District Engineer detailing compliance with this condition (i.e. why the discharge must occur in waters of the US and why additional minimization cannot be achieved);

g. The stormwater management facility must comply with General Condition 21 and be designed using BMPs and watershed protection techniques. Examples may include forebays (deeper areas at the upstream end of the stormwater management facility that would be maintained through excavation), vegetated buffers, and siting considerations to minimize adverse effects to aquatic resources. Another example of a BMP would be bioengineering methods incorporated into the facility design to benefit water quality and minimize adverse effects to aquatic resources from storm flows, especially downstream of the facility, that provide, to the maximum extent practicable, for long term aquatic resource protection and enhancement;

h. Maintenance excavation will be in accordance with an approved maintenance plan and will not exceed the original contours of the facility as approved and constructed; and

i. The discharge is part of a single and complete project.

(Section 404)

Nationwide 43 Specific Regional Conditions

- Notification is required for all impacts to Section 10 waters and wetlands adjacent to Section 10 waters.
- Notification is required for all perennial and intermittent stream impacts.
- Notification is required for ephemeral stream impacts greater than 300 linear feet.

Ohio State Certification General Limitations and Conditions apply to this nationwide permit.

Ohio State Certification Special Conditions and Limitations: This Certification shall not authorize the construction of new stormwater management facilities.

44. *Mining Activities.* Revoked from use in Ohio. This NWP generally covers non-coal mining activities.

C. NATIONWIDE PERMIT GENERAL CONDITIONS

The following General Conditions must be followed in order for any authorization by an NWP to be valid:

1. **Navigation.** No activity may cause more than a minimal adverse effect on navigation.
2. **Proper Maintenance.** Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.
3. **Soil Erosion and Sediment Controls.** Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
4. **Aquatic Life Movements.** No activity may substantially disrupt the necessary life-cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
5. **Equipment.** Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.
6. **Regional and Case-By-Case Conditions.** The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state or tribe in its Section 401 Water Quality Certification and Coastal Zone Management Act consistency determination.
7. **Wild and Scenic Rivers.** No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status; unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation, or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).
8. **Tribal Rights.** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
9. **Water Quality.** (a) In certain states and tribal lands an individual 401 Water Quality Certification must be obtained or waived (See 33 CFR 330.4(c)).
(b) For NWPs 12, 14, 17, 18, 32, 39, 40, 42, 43, and 44, where the state or tribal 401 certification (either generically or individually) does not require or approve water quality management measures, the permittee must provide water quality management measures that will ensure that the authorized work does not result in more than minimal degradation of water quality (or the Corps determines that compliance with state or local standards, where applicable, will ensure no more than minimal adverse effect on water quality). An

important component of water quality management includes stormwater management that minimizes degradation of the downstream aquatic system, including water quality (refer to General Condition 21 for stormwater management requirements). Another important component of water quality management is the establishment and maintenance of vegetated buffers next to open waters, including streams (refer to General Condition 19 for vegetated buffer requirements for the NWP). This condition is only applicable to projects that have the potential to affect water quality. While appropriate measures must be taken, in most cases it is not necessary to conduct detailed studies to identify such measures or to require monitoring.

10. **Coastal Zone Management.** In certain states, an individual state coastal zone management consistency concurrence must be obtained or waived (see 33 CFR 330.4(d)).
11. **Endangered Species.** (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. Non-federal permittees shall notify the District Engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or is located in the designated critical habitat and shall not begin work on the activity until notified by the District Engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that may affect Federally-listed endangered or threatened species or designated critical habitat, the notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. As a result of formal or informal consultation with the FWS or NMFS the District Engineer may add species-specific regional endangered species conditions to the NWPs.
(b) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the USFWS or the NMFS, both lethal and non-lethal "takes" of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the USFWS and NMFS or their World Wide Web pages at <http://www.fws.gov/r9endspp/endspp.html> and http://www.nmfs.gov/prot_res/esahome.html respectively.
12. **Historic Properties.** No activity which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places is authorized, until the District Engineer has complied with the provisions of 33 CFR part 325, Appendix C. The prospective permittee must notify the District Engineer if the authorized activity may affect any historic properties listed, determined to be eligible, or which the prospective permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin the activity until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the State Historic Preservation Office and the National Register of Historic Places (see 33 CFR 330.4(g)). For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the notification must state

which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

13. **Notification.** (a) Timing; where required by the terms of the NWP, the prospective permittee must notify the District Engineer with a preconstruction notification (PCN) as early as possible. The District Engineer must determine if the notification is complete within 30 days of the date of receipt and can request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the District Engineer will notify the prospective permittee that the notification is still incomplete and the PCN review process will not commence until all of the requested information has been received by the District Engineer. The prospective permittee shall not begin the activity:
- (1) Until notified in writing by the District Engineer that the activity may proceed under the NWP with any special conditions imposed by the District or Division Engineer; or
 - (2) If notified in writing by the District or Division Engineer that an Individual Permit is required; or
 - (3) Unless 45 days have passed from the District Engineer's receipt of the complete notification and the prospective permittee has not received written notice from the District or Division Engineer. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).
- (b) Contents of Notification: The notification must be in writing and include the following information:
- (1) Name, address and telephone numbers of the prospective permittee;
 - (2) Location of the proposed project;
 - (3) Brief description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), Regional General Permit(s), or Individual Permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP (Sketches usually clarify the project and when provided result in a quicker decision.);
 - (4) For NWPs 7, 12, 14, 18, 21, 34, 38, 39, 40, 41, 42, and 43, the PCN must also include a delineation of affected special aquatic sites, including wetlands, vegetated shallows (e.g., submerged aquatic vegetation, seagrass beds), and riffle and pool complexes (see paragraph 13(f));
 - (5) For NWP 7 (Outfall Structures and Maintenance), the PCN must include information regarding the original design capacities and configurations of those areas of the facility where maintenance dredging or excavation is proposed;
 - (6) For NWP 14 (Linear Transportation Projects), the PCN must include a compensatory mitigation proposal to offset permanent losses of waters of the US and a statement describing how temporary losses of waters of the US will be minimized to the maximum extent practicable;
 - (7) For NWP 21 (Surface Coal Mining Activities), the PCN must include an Office of Surface Mining (OSM) or state-approved mitigation plan, if applicable. To be authorized by this NWP, the District Engineer must determine that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are minimal

both individually and cumulatively and must notify the project sponsor of this determination in writing;

(8) For NWP 27 (Stream and Wetland Restoration Activities), the PCN must include documentation of the prior condition of the site that will be reverted by the permittee;

(9) For NWP 29 (Single-Family Housing), the PCN must also include:

(i) Any past use of this NWP by the Individual Permittee and/or the permittee's spouse;

(ii) A statement that the single-family housing activity is for a personal residence of the permittee;

(iii) A description of the entire parcel, including its size, and a delineation of wetlands. For the purpose of this NWP, parcels of land measuring 1/4-acre or less will not require a formal on-site delineation. However, the applicant shall provide an indication of where the wetlands are and the amount of wetlands that exists on the property. For parcels greater than 1/4-acre in size, formal wetland delineation must be prepared in accordance with the current method required by the Corps. (See paragraph 13(f));

(iv) A written description of all land (including, if available, legal descriptions) owned by the prospective permittee and/or the prospective permittee's spouse, within a one mile radius of the parcel, in any form of ownership (including any land owned as a partner, corporation, joint tenant, co-tenant, or as a tenant-by-the-entirety) and any land on which a purchase and sale agreement or other contract for sale or purchase has been executed;

(10) For NWP 31 (Maintenance of Existing Flood Control Facilities), the prospective permittee must either notify the District Engineer with a PCN prior to each maintenance activity or submit a five year (or less) maintenance plan. In addition, the PCN must include all of the following:

(i) Sufficient baseline information identifying the approved channel depths and configurations and existing facilities. Minor deviations are authorized, provided the approved flood control protection or drainage is not increased;

(ii) A delineation of any affected special aquatic sites, including wetlands; and,

(iii) Location of the dredged material disposal site;

(11) For NWP 33 (Temporary Construction, Access, and Dewatering), the PCN must also include a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic resources;

(12) For NWPs 39, 43 and 44, the PCN must also include a written statement to the District Engineer explaining how avoidance and minimization for losses of waters of the US were achieved on the project site;

(13) For NWP 39 and NWP 42, the PCN must include a compensatory mitigation proposal to offset losses of waters of the US or justification explaining why compensatory mitigation should not be required. For discharges that cause the loss of greater than 300 linear feet of an intermittent stream bed, to be authorized, the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts in writing before the permittee may proceed;

- (14) For NWP 40 (Agricultural Activities), the PCN must include a compensatory mitigation proposal to offset losses of waters of the US. This NWP does not authorize the relocation of greater than 300 linear-feet of existing serviceable drainage ditches constructed in non-tidal streams unless, for drainage ditches constructed in intermittent non-tidal streams, the District Engineer waives this criterion in writing, and the District Engineer has determined that the project complies with all terms and conditions of this NWP, and that any adverse impacts of the project on the aquatic environment are minimal, both individually and cumulatively;
- (15) For NWP 43 (Stormwater Management Facilities), the PCN must include, for the construction of new stormwater management facilities, a maintenance plan (in accordance with state and local requirements, if applicable) and a compensatory mitigation proposal to offset losses of waters of the US. For discharges that cause the loss of greater than 300 linear feet of an intermittent stream bed, to be authorized, the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts in writing before the permittee may proceed;
- (16) For NWP 44 (Mining Activities), the PCN must include a description of all waters of the US adversely affected by the project, a description of measures taken to minimize adverse effects to waters of the US, a description of measures taken to comply with the criteria of the NWP, and a reclamation plan (for all aggregate mining activities in isolated waters and non-tidal wetlands adjacent to headwaters and any hard rock/mineral mining activities);
- (17) For activities that may adversely affect Federally-listed endangered or threatened species, the PCN must include the name(s) of those endangered or threatened species that may be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work; and
- (18) For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the PCN must state which historic property may be affected by the proposed work or include vicinity map indicating the location of the historic property.
- (c) Form of Notification: The standard Individual Permit application form (Form ENG 4345) may be used as the notification but must clearly indicate that it is a PCN and must include all of the information required in (b) (1)-(18) of General Condition 13. A letter containing the requisite information may also be used.
- (d) District Engineer's Decision: In reviewing the PCN for the proposed activity, the District Engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. The prospective permittee may submit a proposed mitigation plan with the PCN to expedite the process. The District Engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. If the District Engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the District Engineer will notify the permittee and include any conditions the District Engineer deems necessary. The District Engineer must approve any compensatory

mitigation proposal before the permittee commences work. If the prospective permittee is required to submit a compensatory mitigation proposal with the PCN, the proposal may be either conceptual or detailed. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the District Engineer will expeditiously review the proposed compensatory mitigation plan. The District Engineer must review the plan within 45 days of receiving a complete PCN and determine whether the conceptual or specific proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the District Engineer to be minimal, the District Engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP. If the District Engineer determines that the adverse effects of the proposed work are more than minimal, then the District Engineer will notify the applicant either: (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an Individual Permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the District Engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level. When conceptual mitigation is included, or a mitigation plan is required under item (2) above, no work in waters of the US will occur until the District Engineer has approved a specific mitigation plan.

(e) Agency Coordination: The District Engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level. For activities requiring notification to the District Engineer that result in the loss of greater than 1/2-acre of waters of the US, the District Engineer will provide immediately (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy to the appropriate Federal or state offices (USFWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the District Engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the District Engineer will wait an additional 15 calendar days before making a decision on the notification. The District Engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The District Engineer will indicate in the administrative record associated with each notification that the resource agencies' concerns were considered. As required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act, the District Engineer will provide a response to NMFS within 30 days of receipt of any Essential Fish Habitat conservation recommendations. Applicants are encouraged to provide the Corps multiple copies of notifications to expedite agency notification.

- (f) **Wetland Delineations:** Wetland delineations must be prepared in accordance with the current method required by the Corps (For NWP 29 see paragraph (b)(9)(iii) for parcels less than 1/4-acre in size). The permittee may ask the Corps to delineate the special aquatic site. There may be some delay if the Corps does the delineation. Furthermore, the 45-day period will not start until the wetland delineation has been completed and submitted to the Corps, where appropriate
14. **Compliance Certification.** Every permittee who has received NWP verification from the Corps will submit a signed certification regarding the completed work and any required mitigation. The certification will be forwarded by the Corps with the authorization letter and will include:
- (a) A statement that the authorized work was done in accordance with the Corps authorization, including any general or specific conditions;
 - (b) A statement that any required mitigation was completed in accordance with the permit conditions; and
 - (c) The signature of the permittee certifying the completion of the work and mitigation.
15. **Use of Multiple Nationwide Permits.** The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the US authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit (e.g. if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the US for the total project cannot exceed 1/3-acre).
16. **Water Supply Intakes.** No activity, including structures and work in navigable waters of the US or discharges of dredged or fill material, may occur in the proximity of a public water supply intake except where the activity is for repair of the public water supply intake structures or adjacent bank stabilization.
17. **Shellfish Beds.** No activity, including structures and work in navigable waters of the US or discharges of dredged or fill material, may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP 4.
18. **Suitable Material.** No activity, including structures and work in navigable waters of the US or discharges of dredged or fill material, may consist of unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.) and material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the CWA).
19. **Mitigation.** The District Engineer will consider the factors discussed below when determining the acceptability of appropriate and practicable mitigation necessary to offset adverse effects on the aquatic environment that are more than minimal.
- (a) The project must be designed and constructed to avoid and minimize adverse effects to waters of the US to the maximum extent practicable at the project site (i.e., on site).
 - (b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.
 - (c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland impacts requiring a PCN, unless the District Engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. Consistent with National policy, the District Engineer

will establish a preference for restoration of wetlands as compensatory mitigation, with preservation used only in exceptional circumstances.

(d) Compensatory mitigation (i.e., replacement or substitution of aquatic resources for those impacted) will not be used to increase the acreage losses allowed by the acreage limits of some of the NWPs. For example, 1/4-acre of wetlands cannot be created to change a 3/4-acre loss of wetlands to a 1/2-acre loss associated with NWP 39 verification. However, 1/2-acre of created wetlands can be used to reduce the impacts of a 1/2-acre loss of wetlands to the minimum impact level in order to meet the minimal impact requirement associated with NWPs.

(e) To be practicable, the mitigation must be available and capable of being done considering costs, existing technology, and logistics in light of the overall project purposes. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferably in the same watershed.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., easements, deed restrictions) of vegetated buffers to open waters. In many cases, vegetated buffers will be the only compensatory mitigation required. Vegetated buffers should consist of native species. The width of the vegetated buffers required will address documented water quality or aquatic habitat loss concerns. Normally, the vegetated buffer will be 25 to 50 feet wide on each side of the stream, but the District Engineers may require slightly wider vegetated buffers to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the Corps will determine the appropriate compensatory mitigation (e.g., stream buffers or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where vegetated buffers are determined to be the most appropriate form of compensatory mitigation, the District Engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland impacts.

(g) Compensatory mitigation proposals submitted with the "notification" may be either conceptual or detailed. If conceptual plans are approved under the verification, then the Corps will condition the verification to require detailed plans be submitted and approved by the Corps prior to construction of the authorized activity in waters of the US.

(h) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases that require compensatory mitigation, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

20. **Spawning Areas.** Activities, including structures and work in navigable waters of the US or discharges of dredged or fill material, in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., excavate, fill, or smother downstream by substantial turbidity) of an important spawning area are not authorized.
21. **Management of Water Flows.** To the maximum extent practicable, the activity must be designed to maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, the activity must not permanently restrict or impede the

passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. The activity must, to the maximum extent practicable, provide for retaining excess flows from the site, provide for maintaining surface flow rates from the site similar to preconstruction conditions, and provide for not increasing water flows from the project site, relocating water, or redirecting water flow beyond preconstruction conditions. Stream channelizing will be reduced to the minimal amount necessary, and the activity must, to the maximum extent practicable, reduce adverse effects such as flooding or erosion downstream and upstream of the project site, unless the activity is part of a larger system designed to manage water flows. In most cases, it will not be a requirement to conduct detailed studies and monitoring of water flow. This condition is only applicable to projects that have the potential to affect waterflows. While appropriate measures must be taken, it is not necessary to conduct detailed studies to identify such measures or require monitoring to ensure their effectiveness. Normally, the Corps will defer to state and local authorities regarding management of water flow.

22. **Adverse Effects From Impoundments.** If the activity creates an impoundment of water, adverse effects to the aquatic system due to the acceleration of the passage of water, and/or the restricting its flow shall be minimized to the maximum extent practicable. This includes structures and work in navigable waters of the US, or discharges of dredged or fill material.
23. **Waterfowl Breeding Areas.** Activities, including structures and work in navigable waters of the US or discharges of dredged or fill material, into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.
24. **Removal of Temporary Fills.** Any temporary fills must be removed in their entirety and the affected areas returned to their preexisting elevation.
25. **Designated Critical Resource Waters.** Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, National Wild and Scenic Rivers, critical habitat for Federally listed threatened and endangered species, coral reefs, state natural heritage sites, and outstanding national resource waters or other waters officially designated by a state as having particular environmental or ecological significance and identified by the District Engineer after notice and opportunity for public comment. The District Engineer may also designate additional critical resource waters after notice and opportunity for comment.
 - (a) Except as noted below, discharges of dredged or fill material into waters of the US are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, and 44 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters. Discharges of dredged or fill materials into waters of the US may be authorized by the above NWPs in National Wild and Scenic Rivers if the activity complies with General Condition 7. Further, such discharges may be authorized in designated critical habitat for Federally listed threatened or endangered species if the activity complies with General Condition 11 and the USFWS or the NMFS has concurred in a determination of compliance with this condition.
 - (b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with General Condition 13, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The District Engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

26. **Fills Within 100-Year Floodplains.** For purposes of this General Condition, 100-year floodplains will be identified through the existing Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps or FEMA-approved local floodplain maps.
- (a) **Discharges in Floodplain; Below Headwaters.** Discharges of dredged or fill material into waters of the US within the mapped 100-year floodplain, below headwaters (i.e. five cfs), resulting in permanent above-grade fills, are not authorized by NWP's 39, 40, 42, 43, and 44.
- (b) **Discharges in Floodway; Above Headwaters.** Discharges of dredged or fill material into waters of the US within the FEMA or locally mapped floodway, resulting in permanent above-grade fills, are not authorized by NWP's 39, 40, 42, and 44.
- (c) The permittee must comply with any applicable FEMA-approved state or local floodplain management requirements.
27. **Construction Period.** For activities that have not been verified by the Corps and the project was commenced or under contract to commence by the expiration date of the NWP (or modification or revocation date), the work must be completed within 12-months after such date (including any modification that affects the project). For activities that have been verified and the project was commenced or under contract to commence within the verification period, the work must be completed by the date determined by the Corps. For projects that have been verified by the Corps, an extension of a Corps approved completion date maybe requested. This request must be submitted at least one month before the previously approved completion date.

D. FURTHER INFORMATION

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWP's do not obviate the need to obtain other Federal, state, or local permits, approvals, or authorizations required by law.
3. NWP's do not grant any property rights or exclusive privileges.
4. NWP's do not authorize any injury to the property or rights of others.
5. NWP's do not authorize interference with any existing or proposed Federal project.

E. DEFINITIONS

- **Best Management Practices (BMPs):** BMPs are policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural. A BMP policy may affect the limits on a development.
- **Compensatory Mitigation:** For purposes of Section 10/404, compensatory mitigation is the restoration, creation, enhancement, or in exceptional circumstances, preservation of wetlands and/or other aquatic resources for the purpose of compensating for unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.
- **Creation:** The establishment of a wetland or other aquatic resource where one did not formerly exist.
- **Enhancement:** Activities conducted in existing wetlands or other aquatic resources that increase one or more aquatic functions.

- **Ephemeral Stream:** An ephemeral stream has flowing water only during and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.
- **Farm Tract:** A unit of contiguous land under one ownership that is operated as a farm or part of a farm.
- **Flood Fringe:** That portion of the 100-year floodplain outside of the floodway (often referred to as "floodway fringe").
- **Floodway:** The area regulated by Federal, state, or local requirements to provide for the discharge of the base flood so the cumulative increase in water surface elevation is no more than a designated amount (not to exceed one foot as set by the National Flood Insurance Program) within the 100-year floodplain.
- **Independent Utility:** A test to determine what constitutes a single and complete project in the Corps regulatory program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.
- **Intermittent Stream:** An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.
- **Loss of Waters of the US:** Waters of the US that include the filled area and other waters that are permanently adversely affected by flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent above-grade, at-grade, or below-grade fills that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the US is the threshold measurement of the impact to existing waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and values. The loss of stream bed includes the linear feet of stream bed that is filled or excavated. Impacts to ephemeral streams are not included in the linear foot measurement of loss of stream bed for the purpose of determining compliance with linear foot limits of NWPs 39, 40, 42, and 43. Waters of the US temporarily filled, flooded, excavated, or drained, but restored to preconstruction contours and elevations after construction, are not included in the measurement of loss of waters of the US.
- **Non-tidal Wetland:** A non-tidal wetland is a wetland (i.e., a water of the US) that is not subject to the ebb and flow of tidal waters. The definition of a wetland can be found at 33 CFR 328.3(b). Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).
- **Open Water:** An area that, during a year with normal patterns of precipitation, has standing or flowing water for sufficient duration to establish an ordinary high water mark. Aquatic vegetation within the area of standing or flowing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. The term "open water"

includes rivers, streams, lakes, and ponds. For the purposes of the NWP's, this term does not include ephemeral waters.

- **Perennial Stream:** A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.
- **Permanent Above-grade Fill:** A discharge of dredged or fill material into waters of the US, including wetlands, that results in a substantial increase in ground elevation and permanently converts part or all of the waterbody to dry land. Structural fills authorized by NWP's 3, 25, 36, etc. are not included.
- **Preservation:** The protection of ecologically important wetlands or other aquatic resources in perpetuity through the implementation of appropriate legal and physical mechanisms. Preservation may include protection of upland areas adjacent to wetlands as necessary to ensure protection and/or enhancement of the overall aquatic ecosystem.
- **Restoration:** Re-establishment of wetland and/or other aquatic resource characteristics and function(s) at a site where they have ceased to exist, or exist in a substantially degraded state.
- **Riffle and Pool Complex:** Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.
- **Single and Complete Project:** The term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers (see definition of independent utility). For linear projects, the "single and complete project" (i.e., a single and complete crossing) will apply to each crossing of a separate water of the US (i.e., a single waterbody) at that location. An exception is for linear projects crossing a single waterbody several times at separate and distant locations: each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies.
- **Stormwater Management:** Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.
- **Stormwater Management Facilities:** Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and BMP's, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.
- **Stream Bed:** The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

- **Stream Channelization:** The manipulation of a stream channel to increase the rate of water flow through the stream channel. Manipulation may include deepening, widening, straightening, armoring, or other activities that change the stream cross-section or other aspects of stream channel geometry to increase the rate of water flow through the stream channel. A channelized stream remains a water of the US, despite the modifications to increase the rate of water flow.
- **Tidal Wetland:** A tidal wetland is a wetland (i.e., water of the US) that is inundated by tidal waters. The definitions of a wetland and tidal waters can be found at 33 CFR 328.3(b) and 33 CFR 328.3(f), respectively. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line (i.e., spring high tide line) and are inundated by tidal waters two times per lunar month, during spring high tides.
- **Vegetated Buffer:** A vegetated upland or wetland area next to rivers, streams, lakes, or other open waters which separates the open water from developed areas, including agricultural land. Vegetated buffers provide a variety of aquatic habitat functions and values (e.g., aquatic habitat for fish and other aquatic organisms, moderation of water temperature changes, and detritus for aquatic food webs) and help improve or maintain local water quality. A vegetated buffer can be established by maintaining an existing vegetated area or planting native trees, shrubs, and herbaceous plants on land next to open-waters. Mowed lawns are not considered vegetated buffers because they provide little or no aquatic habitat functions and values. The establishment and maintenance of vegetated buffers is a method of compensatory mitigation that can be used in conjunction with the restoration, creation, enhancement, or preservation of aquatic habitats to ensure that activities authorized by NWP result in minimal adverse effects to the aquatic environment. (See General Condition 19.)
- **Vegetated Shallows:** Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.
- **Waterbody:** A waterbody is any area that in a normal year has water flowing or standing above ground to the extent that evidence of an ordinary high water mark is established. Wetlands contiguous to the waterbody are considered part of the waterbody.

F. REGIONAL GENERAL CONDITIONS:

- Notifications for all Nationwide permits should include a location map (USGS topographical map) and project drawings on 8 1/2" x 11" paper.
- Nationwide Permits shall not authorize any activity which impacts bogs and/or fens.
- No Nationwide permit may be used in Lake Erie for purposes of diverting water from the Great Lakes.

- In order to determine if a project meets the terms and conditions of the Ohio EPA's 401 water quality certification, **two copies of** the following information is necessary:
 - All wetland delineations must include the latest approved version of the Ohio Rapid Assessment Method (ORAM) for wetland evaluation, long form. (This will assist OEPA in determining the category of wetland the applicant proposes to impact.)
 - Photographs of the wetland.

NOTE: This information is in addition to the required information listed under General Condition 13 (Notification) of the NWP.

- Notification is required for all work in Critical Resource Waters.

The following are designated as **Critical Resource Waters**:

- Special habitat waters of Lake Erie including the shoreline, off shore islands, rock outcrops, and adjacent waters within the boundaries defined as 82° 22' 30" West Longitude, 83° 07' 30" West Longitude, 41° 33' 00" North Latitude, and 42° 33' 00" North Latitude. This portion of Lake Erie is designated as a CRW because the Lake Erie water snake (*Nerodia sipedon insularum*), a Federally listed threatened species resides in portions of this geographic area.
- In Ohio, two areas have been designated critical habitat for the piping plover (*Charadrius melodus*) and are defined as lands 0.62 miles inland from normal high water line. Unit OH-1, extends from the mouth of Sawmill Creek to the western property boundary of Sheldon Marsh State Natural Area, Erie County, encompassing approximately 2.0 miles. Unit OH-2, extends from the eastern boundary line of Headland Dunes Nature Preserve to the western boundary of the Nature Preserve and Headland Dunes State Park, Lake County, encompassing approximately 0.5 mile.
- Big and Little Darby Creeks (National Wild and Scenic River System): Big Darby Creek from Champaign-Union County line downstream to the Conrail railroad trestle and from the confluence with the Little Darby Creek downstream to the Scioto River. Little Darby Creek from the Lafayette Plain City Road Bridge downstream to within 0.8 mile from the confluence with Big Darby Creek. Total designation is approximately 82 miles.
- Little Beaver Creek (National Wild and Scenic River System): Little Beaver Creek main stem, from the confluence of West Fork with Middle Fork near Williamsport to mouth; North Fork from confluence of Brush Run and North Fork to confluence of North Fork with main stem at Fredericktown; Middle Fork from vicinity of Co. Rd. 901 (Elkton Road) bridge crossing to confluence of Middle Fork with West Fork near Williamsport; West Fork from vicinity of Co. Rd. 914 (Y-Camp Road) bridge crossing east to confluence of West Fork with Middle Fork near Williamsport. Total designation is 33 miles
- Little Miami (Scenic component of the National System from Clifton to Foster) The portion from Foster to the Ohio River was designated a Recreational component of the National system. Total designation is 92 miles.

- Notification is required for all activities in state Wild and Scenic Rivers (see list below).
The following are **State Wild and Scenic Rivers**:

Little Miami River - Clermont County line at Loveland to headwaters, including North Fork, Clermont County line at Loveland to confluence with East Fork and from the confluence with East Fork to Ohio River. Miles designated (approximate): 105

Sandusky River - US Rt. 30 in Upper Sandusky to Roger Young Memorial Park in Fremont. Miles designated (approximate): 65

Olentangy River - Delaware Dam to Old Wilson Bridge Road in Worthington. Miles designated (approximate): 22

Little Beaver Creek - *Wild segments* - West Fork from 1/4 mile downstream from Twp. Rd. 914 to confluence with Middle Fork. North Fork from Twp Rd. 952 to confluence with Little Beaver Creek. Little Beaver Creek from confluence of West and Middle Forks downstream to 3/4 mile north of Grimm's Bridge.
Scenic segments - North Fork from Ohio-Pennsylvania line downstream to Jackman Road. Middle Fork from Elkton Rd. (Twp. Rd. 901) downstream to confluence with West Fork. Little Beaver Creek from 3/4 mile north of Grimm's Bridge downstream to the Ohio-Pennsylvania line. Miles designated (approximate): Wild 20, Scenic 16

Grand River - *Wild segment* - from Harpersfield covered bridge downstream to Norfolk and Western Railroad trestle south of Painesville. *Scenic segment* - from St. Rt. 322 Bridge in Ashtabula County downstream to Harpersfield covered bridge. Miles designated (approximate): Scenic 33, Wild 23

Upper Cuyahoga River - Troy-Burton Township line in Geauga County to US Rt. 14. Miles designated (approximate): 25

Maumee River - *Scenic segment* - Ohio-Indiana line to St. Rt. 24 bridge west of Defiance. *Recreational segment* - St. Rt. 24 Bridge west of Defiance to US Rt. 25 Bridge near Perrysburg. Miles designated (approximate): Scenic 43, Recreational 53

Stillwater River System - *Recreational segment* - Englewood dam to confluence with Great Miami River. *Scenic segments* - Stillwater River from Riffle Road bridge in Darke Co. to Englewood dam. Greenville Creek from the Ohio-Indiana state line to the confluence with the Stillwater. Miles designated (approximate): Scenic 83, Recreational 10

Chagrin River - Aurora Branch from St. Rt. 82 bridge downstream to confluence with Chagrin. Chagrin River from confluence with Aurora Branch downstream to St. Rt. 6 bridge. East Branch from Heath Road bridge downstream to confluence with Chagrin. Miles designated (approximate): 49

Big and Little Darby Creeks - Big Darby Creek from the Champaign-Union County line downstream to the U.S. Rt. 40 Bridge, from the northern boundary of Battelle-Darby Creek Metro Park to the confluence with the Little Darby Creek downstream to the Scioto River. Little Darby Creek from the Lafayette-Plain City Road Bridge downstream to the confluence with Big Darby Creek. Miles designated (approximate): 84

Kokosing River - Knox/Morrow County line to confluence with Mohican River. North Branch of Kokosing from confluence with East Branch downstream to confluence with main stem. Miles designated (approximate): 48

G. OHIO STATE CERTIFICATION GENERAL CONDITIONS FOR NATIONWIDE PERMITS.

A) Streams:

- 1) Temporary or permanent impacts to intermittent and perennial streams for any single and complete project are limited to a maximum of two hundred (200) linear feet [except for NWP 3, 12, 21, 27, and 41];
- 2) Temporary or permanent impacts to ephemeral streams for any single and complete project are limited to a maximum of three hundred (300) linear feet [except for NWP 3, 12, 21, 27, and 41];
- 3) Temporary or permanent impacts to Exceptional Warmwater Habitat, Cold Water Habitat, Seasonal Salmonid, or any equivalent designation, or with an antidegradation category of State Resource Water, Superior High Quality Water (except as it applies to Lake Erie), Outstanding National Resource Waters, or Outstanding High Quality Waters are prohibited [except for NWP 3 and maintenance activities covered under NWP 7, 12, and 33];
- 4) Temporary or permanent impacts to the designated portions of national or state scenic rivers are prohibited [except for NWP 3 and maintenance activities covered under NWP 12];
- 5) Stream reconstruction activities shall adhere to natural channel design techniques;
- 6) Off-site stream or buffer improvements and/or mitigative measures required by the Corps:
 - a. In order of priority, these measures shall focus on 1) the stream segment being impacted, 2) upstream segments and tributaries, 3) the receiving stream. The measures should, to the extent practicable, consider the causes and sources of impairment of the stream where the measures would be undertaken if the stream is listed as impaired in the most recent final report submitted to the United States environmental protection agency by the director of Ohio EPA to fulfill the

requirements of Section 303(d) of the Clean Water Act. The current list of impaired streams, as of the date of this certification, can be found on the Ohio EPA web site at: <http://www.epa.state.oh.us/dsw/tmdl/303dnotc.html> (Tables 1 through 6).

b. If the applicant cannot find appropriate mitigation on streams listed in section a) above, mitigation shall be in the Ohio EPA 8-digit watershed.

7) On-site stream or buffer improvements and/or mitigative measures required by the Corps:

- a) Vegetative buffers on both stream banks an appropriate length; and
- b) A minimum width of 25 feet for preservation of existing vegetative buffers; or
- c) A minimum width of 50 feet for re-vegetating buffers cleared during construction.

8) Compensatory mitigation for linear projects (e.g., highways) in streams may be mitigated for by the following, in descending order of practicability:

- a) Stream impacts associated with a linear project may be mitigated on-site, defined as within one mile of the linear project, in each Ohio EPA 8-digit watershed as shown in OAC 3745-1-54(F)(2); or
- b) Stream impacts associated with a linear project may be mitigated at a single stream mitigation location or stream mitigation bank (if and when such a bank is established), acceptable to the director, within each Ohio EPA 8-digit watershed in which such impacts occur; or
- c) If no stream mitigation bank, acceptable to the director, is located within the Ohio EPA 8-digit watershed in which the impact occurs, then mitigation may occur in another Ohio EPA 8-digit watershed impacted by the linear project; at a single stream mitigation location, or a stream mitigation bank, acceptable to the director; or
- d) If no stream mitigation bank exists within any of the watersheds connected with the linear project, then mitigation should occur within the watershed in which the largest impacts (in terms of area) occur.

B) Wetlands:

- 1) Temporary or permanent impacts to Category 3 wetlands are prohibited.
- 2) Temporary or permanent impacts to Category 1 and 2 wetlands for any single and complete project are limited to a maximum total of ½ acre [except for NWP 21 & 27].
- 3) Wetland mitigation shall adhere to the requirements set forth in Ohio EPA's Wetland Water Quality Standards (OAC 3745-1-50 through 54). [In the event that suitable mitigation cannot be located on-site (within one mile) or within the watershed, mitigation may be located outside of the watershed if there are significant ecological reasons to do so].

C) General:

- 1) Impacts shall be measured linearly from upstream to downstream, including the length of stream impoundments, when calculating the total length of stream impacts [except for NWP 12, for which impacts shall be measured bank-to-bank].
- 2) NWPs cannot be combined to increase any of the aforementioned limitations.
- 3) Authorization under this Certification does not relieve the permittee from the responsibility of obtaining any other federal, state or local permits, approvals or authorizations required by law, including without limitation, National Pollutant Discharge Elimination System (NPDES) permits or Permits to install (PTIs).
- 4) In order to control pollution of public waters by soil sediment from accelerated stream channel erosion and flood plain erosion caused by accelerated stormwater runoff from development areas, permittees shall comply with Ohio Administrative Code 1501:15-1-05 Stream Channel and Floodplain Erosion, or successor rule, as applicable to the project pursuant to OAC 1501:15-1-02.
- 5) OAC 1501:15-1-05 states that the peak rates of runoff from an area after development may be no greater than the peak rates of runoff from the same area before development for all twenty-four-hour storms from one to one-hundred-year frequency.
- 6) Locally required post development stormwater ponds shall incorporate specific design features for water quality such as those listed in Chapter One of the Ohio Department of Natural Resource's Rainwater and Land Development: Ohio's Standards for Stormwater Management, Land Development and Urban Stream Protection. 2nd Ed. Mecklenburg, Dan. Ohio Department of Natural Resources, Division of Soil and Water Conservation. 1996 (or successor document), to the extent allowed by local stormwater requirements. These features include: infiltration trenches, extended detention, wet pools, forebays, aquatic benches and wetlands, optimum flow length, reverse flow pipe, optimum pool depth, shading and buffer plants, and runoff reuse.
- 7) The Best Management Practices (BMPs) listed below shall be utilized with all NWPs when applicable.
 - a) The filling of, and discharge of dredged material into, Category 3 wetlands is prohibited under this permit;
 - b) Only suitable material, free of toxic contaminants in other than trace quantities, shall be used as fill material;
 - c) The use of asphalt and rubber tires as fill is prohibited under this permit;
 - d) All hydric topsoil removed from a trench shall be separated and saved for later placement as the topmost backfill layer when the trench is refilled;
 - e) The stockpiling of side-cast dredged material in wetlands in excess of three (3) months is prohibited;
 - f) The applicant will comply with all requirements for final stabilization of the site contained in applicable NPDES construction stormwater permits for the site;

- g) Vegetated buffer strips extending to the top of both stream banks and beyond as stipulated by the Corps or Ohio EPA, using native tree and shrub species with rapid growth characteristics, shall be planted as soon as practicable after impacting stream channel slopes;
- h) Impacts to surface water buffer vegetation shall be minimized to the maximum extent practicable;
- i) Excavating equipment shall not be placed below the Ordinary High Water Mark (OHWM) of any surface water, except when no other alternative is practicable. When no other alternative is practicable to placing excavating equipment below the OHWM, entry to surface waters shall be through a single point of access per stream bank whenever practicable to minimize disturbance to buffer vegetation;
- j) In-stream activities shall not result in the permanent destabilization of the stream banks or stream bed so that degradation to aquatic habitat from turbidity, erosion or scouring is minimized;
- k) In-stream work shall be conducted during low-flow conditions whenever practicable in order to minimize adverse impacts to water quality away from the project site, except in cases of emergency situations which threaten human life or property;
- l) All dredged material placed at an upland site shall be controlled so that sediment runoff to remaining streams and wetlands is minimized to the maximum extent practicable; and
- m) Disturbed areas shall be controlled so that sediment runoff to remaining streams and wetlands is minimized to the maximum extent practicable.



May 13, 2003

Mr. William P. Knepp
Acting District Manager
Mine Safety and Health Administration
5012 Mountaineer Mall
Morgantown WV 26505

Attn: Mr. Pat Betoney

Re: No. 2 Slurry Impoundment (I.D. No. 1211-OH8-0025-03)

Gentlemen:

The Ohio Valley Coal Company presents, for your approval, the enclosed plans to raise the No. 2 Slurry Impoundment 10 ft. Currently, the embankment is at elevation 1125 ft with an ultimate crest elevation of 1130 ft, normal pool at 1120 ft. The proposal is to raise the embankment to an ultimate crest elevation of 1140 ft with normal pool at 1130 ft. The plans show the changes to the crest, the decant system, and the emergency spillway required for this change. We currently are raising the embankment the additional 5 ft to the current target crest and would like to continue to raise the embankment to the new target crest, this year if possible. Please contact Mr. Pete Nix of DLZ Ohio, Inc. or me if you have any questions.

Sincerely,
THE OHIO VALLEY COAL COMPANY

David L. Bartsch, P.E.
Environmental Coordinator and
Permit Administrator

cc: Mr. Nix
File



JUN 18 2004

Mr. Jerry M. Taylor
Corporate Safety Director
The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Dear Mr. Taylor:

The final review of all information concerning the proposed 10-foot raise of embankment crest, invert of the decant pipe inlet, and the invert of the open channel emergency spillway for the No. 2 Slurry Impoundment, MSHA I.D. No. 1211-OH03-00025-03, located at the Powhatan No. 6 Mine, I.D. No. 33-01159, has been completed. The technical issues relative to the original design plan for the 10-foot raise dated May 22, 2003, have been addressed and the modification is hereby approved.

A copy of memorandums dated May 24, 2004, and June 10, 2004, from the Mine Waste and Geotechnical Engineering Division of the Mine Safety and Health Administration are attached to this letter for your information. All recommendations in these memorandums are included in your approved plan.

If you have any questions, please feel free to contact this office.

Sincerely,

A handwritten signature in black ink, appearing to read "Kevin G. Stricklin".

Kevin G. Stricklin
District Manager

Enclosure

cc: ☒ Dave Bartsch, The Ohio Valley Coal Company
Mia Kannik, ODNR

U.S. Department of Labor

Mine Safety and Health Administration
Pittsburgh Safety & Health Technology Center
P.O. Box 18233
Pittsburgh, PA 15236



Mine Waste and Geotechnical Engineering Division

RECEIVED

June 10, 2004

MEMORANDUM FOR KEVIN G. STRICKLIN

District Manager, District 3
Coal Mine Safety and Health

THROUGH:

EDWARD J. MILLER
Chief, Pittsburgh Safety and Health Technology Center

FROM:

KELVIN WU
Chief, Mine Waste and Geotechnical Engineering Division

SUBJECT:

Recommendation for Approval of the Design Plans for the
Proposed 10-Foot Raise and the Downstream Buttress at Ohio
Valley Coal Company's No. 2 Slurry Impoundment, MSHA I.D.
No. 1211-OH03-00025-03, Ohio Valley Coal Company,
Powhatan No. 6 Mine, I.D. No. 33-01159, Belmont County, Ohio

As requested by your office, a technical review of the report titled "Powhatan No. 6 Mine (I.D. No. 33-01159, No. 2 Slurry Impoundment (I.D. No. 1211-OH8-0025-03)" has been completed. The report was submitted to respond to a request for additional information presented in a memorandum from this Division dated May 21, 2004. Report No. MW04-032, which is attached, presents some review observations relative to the No. 2 Slurry Impoundment and a recommendation that the District approve the proposed 10-foot raise of the embankment crest, invert of the decant pipe, and the invert of the open-channel emergency spillway. Additionally, it is recommended that the District approve the design plans for the downstream buttress that was previously placed downstream of the existing embankment in order to mitigate problems caused by excessive seepage.

Please contact this office if there are any questions regarding this report.

cc: T. Bentley, Chief, Safety Div., CMS&H
M. Skiles - Director, TS

UNITED STATES DEPARTMENT OF LABOR

MINE SAFETY AND HEALTH ADMINISTRATION

PITTSBURGH SAFETY AND HEALTH TECHNOLOGY CENTER
MINE WASTE AND GEOTECHNICAL ENGINEERING DIVISION
COCHRANS MILL ROAD
P.O. BOX 18233
PITTSBURGH, PENNSYLVANIA 15236

REPORT NO. MW04-032

REVIEW OF ADDITIONAL INFORMATION REGARDING
THE PROPOSED 10-FOOT RAISE AND THE
DOWNSTREAM BUTTRESS
AT THE NO. 2 SLURRY IMPOUNDMENT
MSHA I.D. NO. 1211-OH03-00025-03
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE, I.D. NO. 33-01159
BELMONT COUNTY, OHIO

JUNE 10, 2004

BY

JAMES B. PFEIFER
CIVIL ENGINEER

REPORT NO. MW04-032**LOCATION AND OWNERSHIP**

The No. 2 Slurry Impoundment is owned and operated by the Ohio Valley Coal Company. The facility is located along State Route 148 in an unnamed tributary to Captina Creek, approximately 2 miles northwest of Alledonia, Ohio. More specifically, the site is located at 39° 55' 12" north latitude and 80° 59' 26" west latitude and can be found on the Armstrongs Mills, Ohio, 7.5-minute quadrangle map of the U.S. Geologic topographic series.

BACKGROUND

Reports and memoranda at the Pittsburgh Safety and Health Technology Center indicate that the No. 2 Slurry Impoundment was originally designed in 1975 by GeoMechanics, Incorporated. The embankment has a cross-valley configuration and the elevation of the original ground surface at the upstream toe is 940 feet (approximate). The maximum crest elevation presented in the original design plan was 1050 feet.

The crest of the embankment was raised to elevation 1065 feet (15 feet) around 1980 using centerline construction techniques. The engineering plan for this modification was prepared by GeoMechanics, Incorporated. In 1990, the company submitted an engineering plan to raise the embankment crest to elevation 1130 feet (65 feet) using upstream construction techniques. The modification plan was prepared by Mason-deVerteuil Geotechnical Services, and was subsequently approved.

Personnel from this Division investigated incidents of excessive seepage on the downstream face of the embankment in the years 1996, 1999, and 2002. In 1996, the company installed an internal drain at approximate elevation 1065 feet to intercept the seepage water. To enhance the stability of the downstream face of the embankment, they recently constructed a buttress for a distance of at least several hundred feet downstream of the embankment. Reportedly, the top elevation of the buttress is near or slightly below the currently approved crest elevation of 1130 feet.

MATERIAL REVIEWED

The company submitted design plans to raise the embankment crest and permanent pool elevation 10 feet in a report dated May 22, 2003. This plan was reviewed and it was requested that the company submit additional information in a memorandum dated February 27, 2004. The company submitted the requested additional information in various reports, drawings, and analyses dated between April 2, 2004, and May 13, 2004. In a memorandum dated May, 24, 2004, it was requested that the

company submit additional information in order to continue the technical review. To address the requested additional information, the company submitted the following which has now been reviewed:

1. A letter report and drawing prepared by the Ohio Valley Coal Company, William J. Siplivy, P.E., Geotechnical Engineer, and DLZ Engineers, Architects, Scientists, Planners, Surveyors (DLZ). The report is dated May 17, 2004, and was received on May 20, 2004.
2. A revised plan-view drawing of the open-channel emergency spillway. This drawing is dated June 2, 2000, was revised on or around May 20, 2004, and was received on May 25, 2004.

It should be noted that the requested additional information was received prior to the date of the memorandum that requests the information. Because the company's critical need to begin construction of this modification, a "draft" version of the memorandum dated May 24, 2004, was forwarded to them in order for them to begin responding to the requested additional information.

DISCUSSION AND RECOMMENDATION

This modification to the impoundment includes raising the embankment crest from elevation 1130 feet to elevation 1140 feet. The invert elevations of the open-channel emergency spillway and decant inlet will also be raised to elevations 1132.5 feet and 1130 feet, respectively. The schedule of the work to be performed is presented in the letter report prepared by DLZ dated May 17, 2004. Once the embankment crest is raised to elevation 1140 feet and the decant structure is raised to elevation 1130 feet, coarse coal refuse will be placed in the open-channel emergency spillway upstream of the proposed weir wall to elevation 1130 feet. Finally, a weir wall in the open-channel emergency spillway will be constructed to elevation 1132.5 feet. It is indicated by the company that it will take approximately 1.5 months to place the fill and construct the weir wall in the open-channel emergency spillway.

Details of the transport section of the open-channel emergency spillway are included on the drawing dated June 2, 2000. This drawing was received by this Division on May 25, 2004. It should be noted that recent revisions to the open-channel emergency spillway are shown on this drawing but the original date on it was not changed and the new revision date was not included. In summary, riprap (average size 9 inches) will be placed between the weir wall and Station 12+25 and between Stations 31+60 and 35+50. The riprap will be grouted in place for the first 5 feet below the weir wall and between Stations 31+60 and 35+50. The channel will be excavated into rock between Stations 12+25 and 31+60.

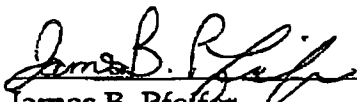
In the event that water flows through the emergency spillway, the entire channel should be inspected. All accumulated debris should be removed and any dislodged riprap should be replaced.

The company will monitor the turbidity of the seepage water from the internal drain immediately after the permanent pool level is raised and they will continue to monitor the flow rates from this underdrain on a weekly basis. In the event that significant changes in the flow rate or turbidity are observed, more frequent monitoring (flow rate and turbidity) will be performed.

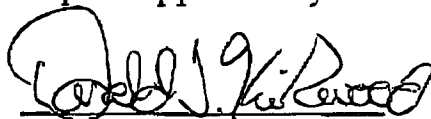
The original design plan for the proposed 10-foot raise is dated May 22, 2003. To address additional information that has been requested by this Division, the company has submitted a number of design plans, drawings, and analyses. Various aspects of the ultimate design and construction plans are contained throughout these submittals. These submittals also contain some erroneous information that may confuse District personnel during future site visits. It is recommended that the company prepare and submit one design plan that includes all of the applicable aspects of this modification.

The technical issues relative to the original design plan (dated May 22, 2003) for the proposed 10-foot raise have been adequately addressed by the company. Additionally, the technical issues relative to the buttress downstream (proposed in a letter report dated May 2, 2002) of the embankment have been adequately addressed by the company. Therefore, it is recommended that the District approve the company's request to raise the embankment crest, and invert elevations of the decant system and emergency spillway, 10 feet in elevation.

Report Prepared by:


James B. Pfeffer
Civil Engineer

Report Approved by:


Donald T. Kirkwood
Supervisory Civil Engineer



Mine Waste and Geotechnical Engineering Division

May 24, 2004

MEMORANDUM FOR KEVIN G. STRICKLIN

District Manager, District 3
Coal Mine Safety and Health

THROUGH:

EDWARD J. MILLER
Chief, Pittsburgh Safety and Health Technology Center

KELVIN K. WU for
Chief, Mine Waste and Geotechnical Engineering Division

DONALD T. KIRKWOOD
Supervisory Civil Engineer, Mine Waste and Geotechnical
Engineering Division

FROM:

JAMES B. PFEIFER
Civil Engineer, Mine Waste and Geotechnical Engineering
Division

SUBJECT:

Request for Additional Information for the Proposed 10-Foot
Raise and the Buttress at Ohio Valley Coal Company's No. 2
Slurry Impoundment, MSHA I.D. No. 1211-OH03-00025-03,
Powhatan No. 6 Mine, I.D. No. 33-01159, Belmont County, Ohio

At the request of your office, a technical review of the additional information that was received from the company has been completed. The additional information was requested in a memorandum from this office dated February 27, 2004. The following five submittals were received from the company and were reviewed:

1. A report titled "Responses to MSHA's Comments, Proposed Ten-Foot Embankment Raising, Slurry Dam No. 2," dated April 2, 2004, and received on May 3, 2004. The report was prepared by DLZ Engineers, Architects, Scientists, Planners and Surveyors.

RECEIVED

2004 JUN -7 PM 1:01

MINE SAFETY AND
HEALTH ADMINISTRATION
PITTSBURGH, WV

2. A letter report titled "Powhatan No. 6 Mine (I.D. No. 33-01159), No. 2 Slurry Impoundment (I.D. No. 1211-OH08-0025-03)," dated April 27, 2004, and received on May 3, 2003. The letter report was prepared by The Ohio Valley Coal Company. It should be noted that the impoundment identification presented in the title for this report is incorrect and the identification has recently been changed to reflect the correct regulating District (CMS&H, District 3).
3. Two drawings for the Perkins Run Coal Refuse Facility. One is titled "Interim Closure Plan" and the other is titled "Cross-Sections." They are both dated July 1998 and were received on May 3, 2004. They were prepared by the Ohio Valley Coal Company.
4. A report titled "Analyses of Pillars Beneath Embankment and Impoundment for Additional 10 Feet." No date was included on this report and it was received on May 3, 2004. The report was prepared by The Ohio Valley Coal Company.
5. A hydraulic analysis of the emergency spillway channel sent via facsimile, dated May 13, 2004, and titled "Material: Riprap, Trapezoidal Channel." The hydraulic analysis was submitted by Ohio Valley Coal Company and was received May 13, 2004.

The company submitted an engineering plan (dated February 9, 2004, and received on February 27, 2004) that addresses comments that were prepared by the District and were presented in a letter dated February 5, 2004. A technical review of this plan was not performed by this Division. These plans and letters are associated with a proposed fill in the adjacent valley to the west of the embankment for the No. 2 Slurry Impoundment. The fill was proposed by the company in order to construct the transport section of the open-channel emergency for the No. 2 Slurry Impoundment. Issues regarding the company's plan for this proposed fill were presented in the memorandum from this Division dated February 27, 2004. This engineering plan is no longer applicable given the recent response by the company: "We respectfully withdraw the requested submittal for the pipe beneath the refuse pile at this time."

The company submitted a letter report dated March 30, 2004, (received April 2, 2004) where they requested that the permanent pool level be raised 2 feet in elevation. At the request of the District, the review of this plan was halted in order to start the review of the additional information for the proposed 10-foot raise that was forwarded by the company.

The company has adequately responded to a portion of the issues that were presented in the memorandum dated February 27, 2004. However, several issues were not adequately addressed and the company should provide additional information for the issues presented below in order to continue with the review.

REVIEW COMMENTS

1. (Original comment No. 2)

Excessive seepage on the downstream face of the embankment has been observed during several site investigations during the last 8 years (approximately). An internal drain was installed around the year 1996 and blackwater was observed discharging from it during site visits in 2002. It was requested that the company comment on any potential adverse conditions, with respect to piping, that may result from raising the permanent pool level an additional 10 feet as proposed.

The company submitted analyses (x-ray diffraction for crystalline phases) that indicates that most of the solids within the blackwater discharge originate from the pool area and not within the embankment (piping). However, the company did not comment on the potential for additional piping of the embankment when the permanent pool level is raised an additional 10 feet.

The company should comment on any potential adverse conditions, with respect to piping, that may result from raising the permanent pool level an additional 10 feet as proposed.

Additionally, it is proposed by the company that seepage from the internal drain will be monitored every 6 months in order to detect any changes with regard to internal erosion within the embankment. It is assumed that the company is referring to the analyses (x-ray diffraction for crystalline phases) similar to what was previously submitted. It is unlikely that in the event that additional piping occurs immediately after the water level is raised, it will coincide with the sampling of the seepage water. It is felt that monitoring the flow rates and turbidity of the seepage immediately after the permanent pool level is raised, will provide valuable information to assess any significant changes in the embankment with respect to piping. Additionally, the seepage and turbidity should be monitored more frequently if changes in either of these are observed.

2. (Original comment No. 3)

It was requested that the company submit fill placement specifications that, as a minimum, address the maximum lift thickness, the minimum density requirements, the allowable range of moisture content of the fill, the maximum particle size of the fill materials, and the frequency of density testing.

While most of fill placement specifications were provided in the notes section of the drawing titled "General Notes," the frequency of density testing was not provided. The company should specify the frequency of density testing for the proposed fill placement.

It is recommended in Chapter 5 of Handbook Number PH89-V-4, Coal Impoundment Inspection Procedures, that:

One field test (density and moisture) by performed for every 2000 cubic yards of compacted structural fill, with at least one test per lift;

One field test for every 200 cubic yards of compacted backfill in trenches or around structures, with at least one test per lift (Note: With small diameter pipes, where the total volume of pipe backfill may be small, more frequent tests than indicated by this criterion should be performed);

One test any time there is suspicion of the effectiveness of compaction; and

Supplementary laboratory compaction curves (proctor tests) for at least every 20 field density tests.

3. (Original comment No. 7)

Although no response is requested from the company, it should be noted that a horizontal acceleration of 0.05g was used in the submitted slope stability files named "OVCCno2downstreamsei and OVCCno2upstreamsei." The use of a horizontal acceleration in a limiting equilibrium slope stability analysis is typically referred to as a pseudo-static analysis. Pseudo-static analyses were developed in the 1960's when earthquake engineering was developing. It has been determined that pseudo-static analyses can underestimate the seismic resistance of embankments and are not considered by MSHA to be an adequate seismic evaluation for centerline and upstream constructed embankments with a high hazard potential classification.

It was indicated in the original design report (dated February 1990) for the currently approved Stage (Stage IV) that nearly all of the fine coal refuse was

displaced during the pushout for the working platform. The report states that "it is believed that the materials encountered by the working platform borings are not susceptible to a liquefaction failure" and "the fine refuse was only encountered in the narrow bottom of the original valley." It is felt that the seismic evaluation provided in the original design report (dated February 1990) for the currently approved Stage (Stage IV) is adequate for the proposed 10-foot-raise.

4. (Original comment No. 8)

It was requested that the company submit a schedule for the construction of all aspects of the proposed modification.

It was indicated by the company that embankment fill will be placed in the spillway to elevation 1130 feet followed by the construction of the spillway crest. It is also indicated that concurrent with these two activities, the crest of the embankment will be raised to elevation 1140 feet and the invert of the decant structure raised to elevation 1136.4 feet.

The crest of the embankment could be overtopped during a significant storm event if the invert elevations of the spillways (emergency and decant) are raised prior to raising the crest of the embankment. The proposed schedule is not acceptable. The embankment crest should be raised to its ultimate design elevation (1140 feet) prior to raising the invert elevations of the emergency spillway and decant pipe. In the event that the invert elevations of the decant pipe and emergency spillway are raised prior to raising the embankment crest to elevation 1140 feet, the company should submit hydrologic analyses that indicate that a minimum of 3 feet of freeboard, during the design storm event, will be maintained at all times.

5. (Original comment No. 9)

It was requested that the company demonstrate that the side slopes of the emergency spillway channel, just downstream of the weir wall, will not excessively erode, or they should provide adequate erosion protection.

The company has proposed the placement of ODOT (Ohio Department of Transportation) Type A riprap at the channel bottom and side slopes (2H:1V).

The company should submit analyses that indicate that the proposed riprap will be adequate for the expected design flow velocities.

6. (Original comment No. 13)

It was requested that the company submit hydraulic analyses for the open-channel emergency spillway and that they provide appropriate erosion protection.

The company submitted an adequate hydraulic analysis on May 13, 2004. It is indicated in the analysis that the depth of flow will be 2.44 feet during the design storm event. It does not appear that any freeboard was included in the input for this analysis.

It should be noted that the proposed depth of flow (2.44 feet) is higher than the channel depth presented on a cross-section on a drawing previously submitted for review. The drawing is titled "ARP Map - Refuse Pile Culvert," and is dated January 16, 2004. A cross-section titled "Perm. FWDD" is presented on the drawing that shows a trapezoidal channel. It is indicated on a note at the bottom of the cross-section that "Down Chute Maximum Channel Depth 2.0'." A note "Perm. Fresh Water Diversion Ditch" with a leader pointing to the open-channel emergency spillway is presented on the plan-view portion of the drawing. The dimensions presented on this cross-section are not adequate if it is intended to represent the open-channel emergency spillway.

The company should submit a typical cross-section of the open-channel spillway. The proposed erosion protection and the dimensions of the channel (with adequate freeboard) should be included on the cross-section.

7. (Original comment No. 14)

In the original submittal, the consultant recommended that the settlement of the embankment crest be periodically monitored. It was requested that this settlement monitoring program be included in the specifications section of the design plan.

The company submitted the settlement monitoring program on the drawing titled "General Notes." It is proposed in this settlement monitoring program that survey points will be monitored on a monthly basis until the settlement in all of the survey points for a given month are 0.5 inches or less.

It is felt that the settlement of fills can occur for up to several years after construction and that it does not occur linearly over time. The company should revise this section of the General Notes to indicate that the settlement monitoring program will continue until it is clear that all settlement has stopped. The company could consider reducing the frequency of survey measurements in the

event that previous measurements show only little or no settlement. After the survey measurements conclusively show that the settlement has stopped, the company should submit verification of this.

8. (Original comment No. 15)

No response regarding this issue is requested from the company. Based on the submitted analyses, it is felt that, despite the fact that the structural capacity of the stoplogs-covered portion of the decant pipe is marginal, the proposed 10-foot-high raise will not significantly increase the loads on it. It is stated in the analyses that significant cracking of the concrete for the stoplogs and the boxwalls has occurred and that these elements essentially act as rafts on the top and sides of the HDPE pipe that was previously inserted. The structural capacity of this section of the decant pipe may be compromised in the event that the company places a substantial amount of fill over it in the future.

9. (Original comment Nos. 19 and 20)

To construct the transport section of the open-channel emergency spillway, the company proposed the placement of approximately 80 feet of fill in the adjacent hollow to the west of the embankment for the No. 2 Slurry Impoundment. A 24-inch-diameter pipe was proposed to drain the runoff from the watershed upstream of this proposed fill.

It was indicated in hydrologic analyses performed by this Division that the contributing watershed to the proposed culvert was approximately 67 acres and it appeared that a substantial amount of water could be impounded by the proposed fill. It was requested that the company submit hydrologic analyses to determine the volume and height of the impounded water and that representative cross-sections of the proposed fill be submitted.

The company indicated that they believe that they can construct the refuse pile upstream of the decant channel without the use of the culvert pipe that was proposed and that they respectfully request to withdraw the submittal for the pipe beneath the refuse pile at this time.

The response does not provide enough information regarding the fill placement in the adjacent hollow for the open-channel emergency spillway. The company should provide a cross-section of the proposed valley fill (with the spillway channel shown) and they should clearly indicate that water will not be impounded during the construction of the transport section of the open-channel emergency spillway.

Please contact this office if there are any questions regarding this review.

cc: T. Bentley - Chief, Safety Div., CMS&H
M. Skiles - Director, TS



May 13, 2003

Mr. Dick Bartz
Chief
Ohio Division of Water
Ohio Department of Natural Resources
1939 Fountain Square Court Building E-3
Columbus OH 43224-1336

Attn: Mr. Tom Lagucki

Re: No. 2 Slurry Impoundment (Permit 075-87)

Gentlemen:

The Ohio Valley Coal Company presents, for your approval, the enclosed plans to raise the No. 2 Slurry Impoundment 10 ft. Currently, the embankment is at elevation 1125 ft with an ultimate crest elevation of 1130 ft, normal pool at 1120 ft. The proposal is to raise the embankment to an ultimate crest elevation of 1140 ft with normal pool at 1130 ft. The plans show the changes to the crest, the decant system, and the emergency spillway required for this change. We currently are raising the embankment the additional 5 ft to the current target crest and would like to continue to raise the embankment to the new target crest, this year if possible. Please contact Mr. Pete Nix of DLZ Ohio, Inc. or me if you have any questions.

Sincerely,
THE OHIO VALLEY COAL COMPANY

David L. Bartsch, P.E.
Environmental Coordinator and
Permit Administrator

cc: Mr. Nix
File



Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

Richard S. Bartz, Chief

Division of Water

January 16, 2004

Mr. David L. Bartsch, P.E.
Environmental Coordinator & Permit Administrator
The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

RE: TOVCCO Slurry Refuse Disposal Dam No. 2
Washington Township, Belmont County
Permit Number 75-087

Dear Mr. Bartsch:

On May 22, 2003, the Division of Water received a letter from you and a design report with plans and specifications from DLZ Ohio, Inc. requesting changes to the approved plans for TOVCCO Slurry Refuse Disposal Dam No. 2 in accordance with Ohio Administrative Code (OAC) Rule 1501:21-15-02. Two copies of the final revisions to the plans and specifications were received on December 12, 2003. An additional copy was received on January 7, 2004. The proposed changes include raising the dam 10 feet, extending the decant structure up the right upstream abutment, and installing a flood wall in the emergency spillway to raise the control section.

Division of Water, Dam Safety Engineering Program staff have reviewed the submitted information and recommended that these proposed changes be approved. Therefore, pursuant to OAC Rule 1501:21-15-02, I am approving the requested changes. These changes will be included as part of Permit Number 75-087.

Enclosed with this letter is one set of the approved revised plans. A separate copy of these plans is being forwarded to the design engineer, Mr. Pete Nix. Please contact Mia Kannik at 614/265-6404 with any questions or comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard S. Bartz".

Richard S. Bartz
Chief, Division of Water

RSB:mpk

cc: Pete Nix, P.E., DLZ Ohio, Inc.
Mia Kannik, P.E., Dam Safety Engineering Program

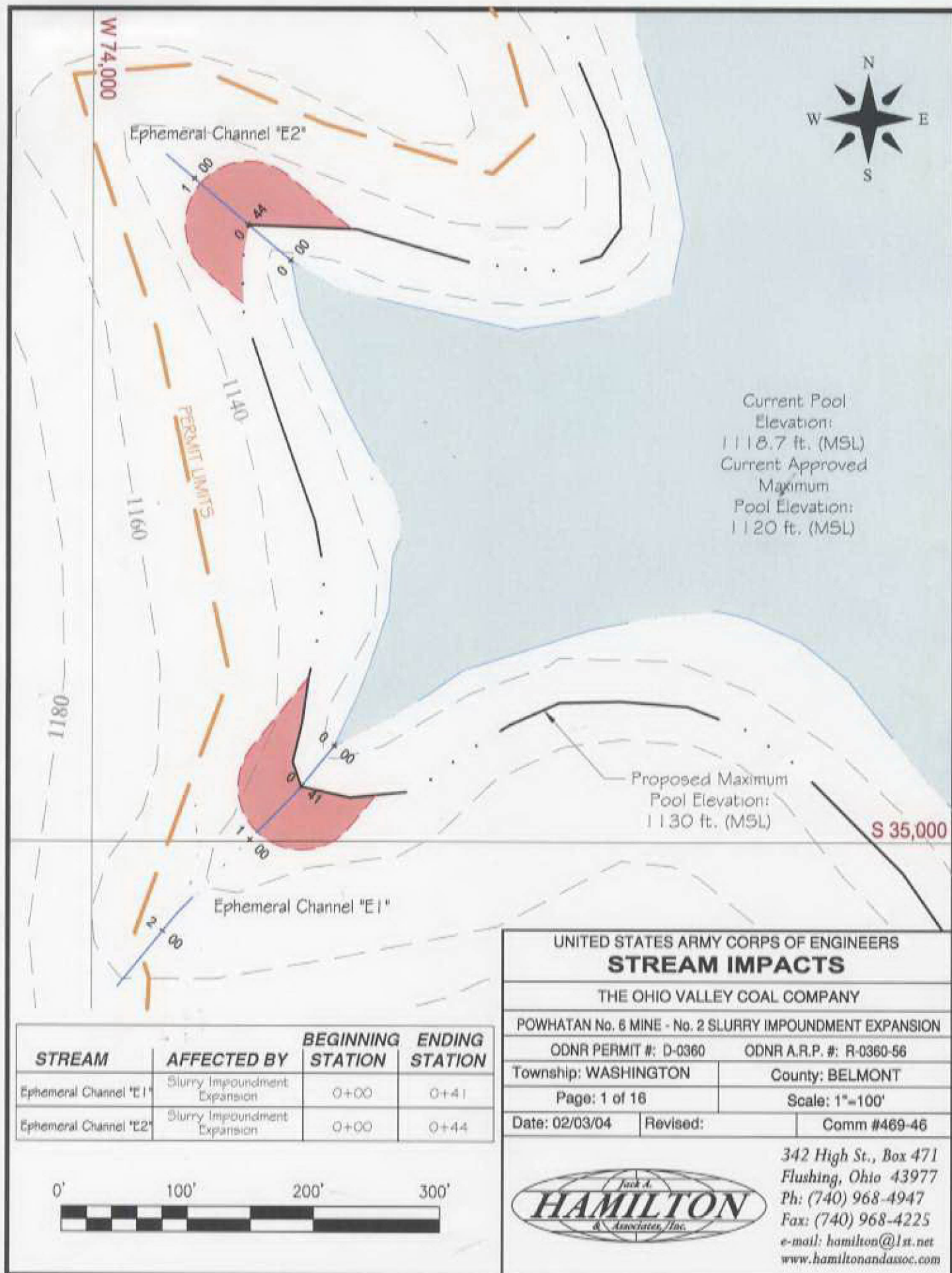
enclosure

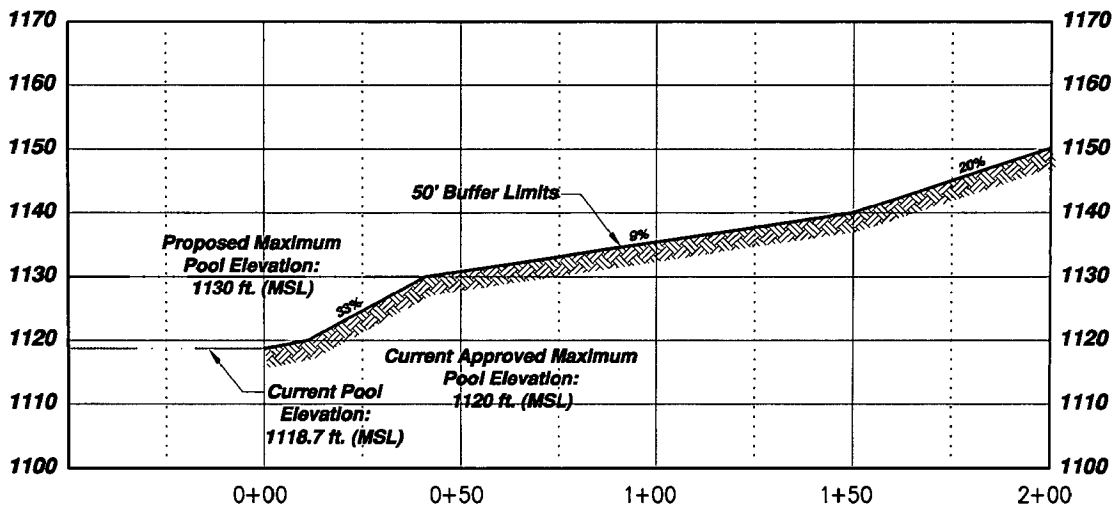
1939 Fountain Square Court/Building E, Columbus, Ohio 43224

STREAM IMPACT TABLE

Stream	Flow Regime	On Site Length	Stream Width	Stream Depth	Area (Ac.)	Drainage Area (Ac)	Volume Dredge & Fill (c.y)
C	I	101	1	0.9	0.002	12.2	1.68
E	I	117	1.3	1.0	0.004	15.0	2.82
F	I	118	1.8	0.8	0.005	35.1	3.15
H	I	209	1.3	0.6	0.006	23.7	3.02
I	I	129	1.5	0.8	0.004	8.6	2.87
J	I	64	0.8	0.6	0.001	5.9	0.57
E1	E	41	1.1	0.8	0.001	7.9	0.67
E2	E	44	1.7	0.5	0.002	5.4	0.69
E3	E	55	1.0	0.7	0.001	8.0	0.71
E4	E	113	1.0	0.4	0.003	4.5	0.84
E5	E	68	1.2	0.7	0.002	6.6	1.06
E6	E	106	1.8	0.7	0.004	7.4	2.47
TOTALS		1,165			0.035	40.3	20.58

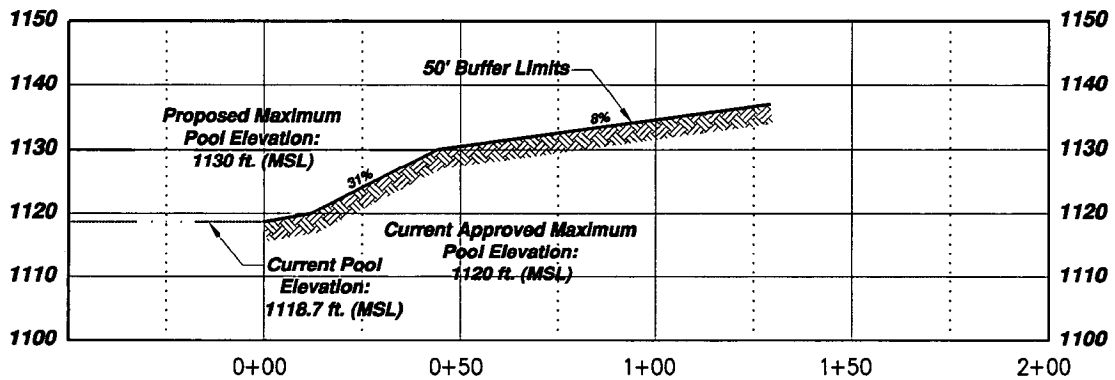
NOTE: 1.) All dimensions are in feet unless noted otherwise.
2.) Drainage area of inundated stream lengths only.





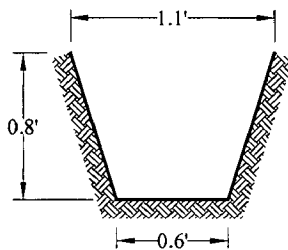
PROFILE EPHEMERAL CHANNEL "E1"

Scale: 1" = 50' Horizontal
1" = 30' Vertical

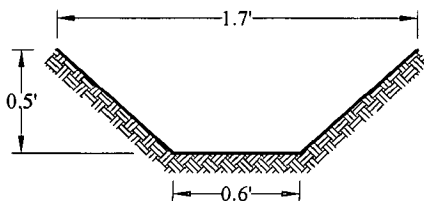


PROFILE EPHEMERAL CHANNEL "E2"

Scale: 1" = 50' Horizontal
1" = 30' Vertical



**TYPICAL SECTION
EPHEMERAL CHANNEL "E1"**
Not to Scale



**TYPICAL SECTION
EPHEMERAL CHANNEL "E2"**
Not to Scale

UNITED STATES ARMY CORPS OF ENGINEERS

STREAM IMPACTS

THE OHIO VALLEY COAL COMPANY

POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION

ODNR PERMIT #: D-0360

ODNR A.R.P. #: R-0360-56

Township: WASHINGTON

County: BELMONT

Page: 2 of 16

Scale: AS NOTED

Date: 02/03/04

Revised:

Comm #469-46



342 High St., Box 471
Flushing, Ohio 43977
Ph: (740) 968-4947
Fax: (740) 968-4225
e-mail: hamilton@1st.net
www.hamiltonandassoc.com

469-46StreamImpact1_cwh.dwg

S 33,000

W 74,000



Unnamed Stream "H"

Unnamed Stream "I"

Unnamed Stream "E"

Proposed Maximum
Pool Elevation:
1130 ft. (MSL)

Current Pool
Elevation:
1118.7 ft. (MSL)
Current Approved
Maximum
Pool Elevation:
1120 ft. (MSL)

UNITED STATES ARMY CORPS OF ENGINEERS

STREAM IMPACTS

THE OHIO VALLEY COAL COMPANY

POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION

ODNR PERMIT #: D-0360

ODNR A.R.P. #: R-0360-56

Township: WASHINGTON

County: BELMONT

Page: 3 of 16

Scale: 1"=100'

Date: 02/03/04

Revised:

Comm #469-46



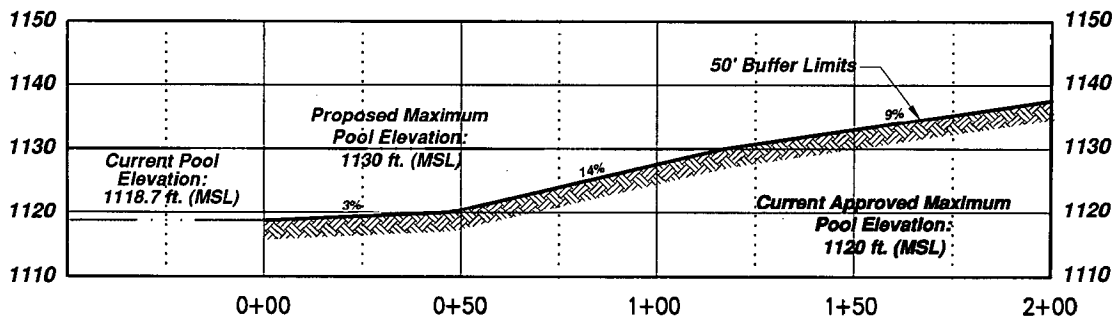
342 High St., Box 471
Flushing, Ohio 43977
Ph: (740) 968-4947
Fax: (740) 968-4225
e-mail: hamilton@1st.net
www.hamiltonandassoc.com

STREAM	AFFECTED BY	BEGINNING STATION	ENDING STATION
Unnamed Stream "E"	Slurry Impoundment Expansion	0+00	1+17
Unnamed Stream "H"	Slurry Impoundment Expansion	0+00	2+09
Unnamed Stream "I"	Slurry Impoundment Expansion	0+00	1+29



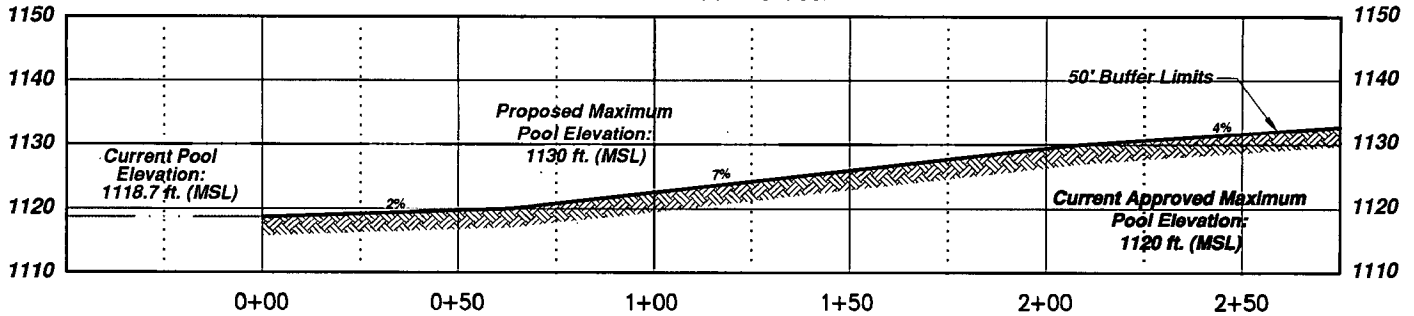
469-46StreamImpact2_cwh.dwg

TOVCC 19875



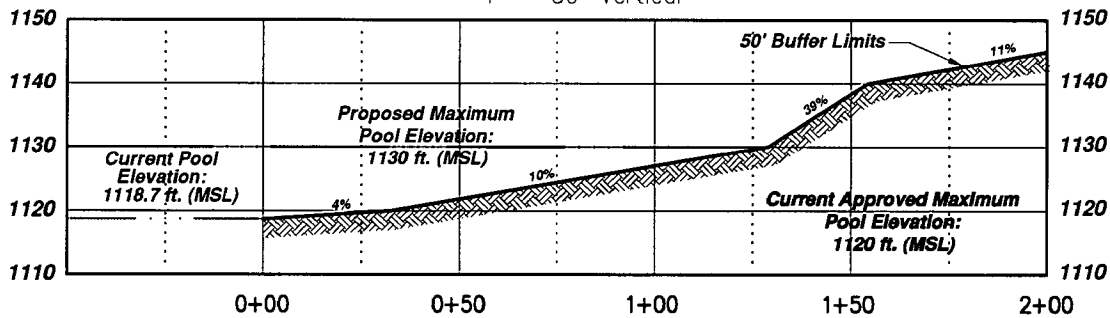
UNNAMED STREAM "E"

Scale: 1" = 50' Horizontal
1" = 30' Vertical



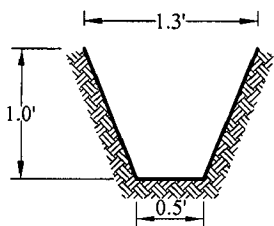
UNNAMED STREAM "H"

Scale: 1" = 50' Horizontal
1" = 30' Vertical

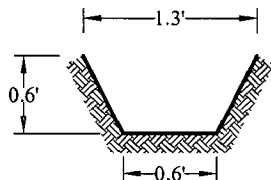


UNNAMED STREAM "I"

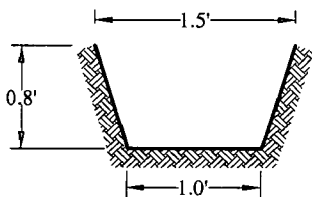
Scale: 1" = 50' Horizontal
1" = 30' Vertical



**TYPICAL SECTION
UNNAMED STREAM "E"**
Not to Scale



**TYPICAL SECTION
UNNAMED STREAM "H"**
Not to Scale



**TYPICAL SECTION
UNNAMED STREAM "I"**
Not to Scale

UNITED STATES ARMY CORPS OF ENGINEERS

STREAM IMPACTS

THE OHIO VALLEY COAL COMPANY

POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION

ODNR PERMIT #: D-0360

ODNR A.R.P. #: R-0360-56

Township: WASHINGTON

County: BELMONT

Page: 4 of 16

Scale: AS NOTED

Date: 02/03/04

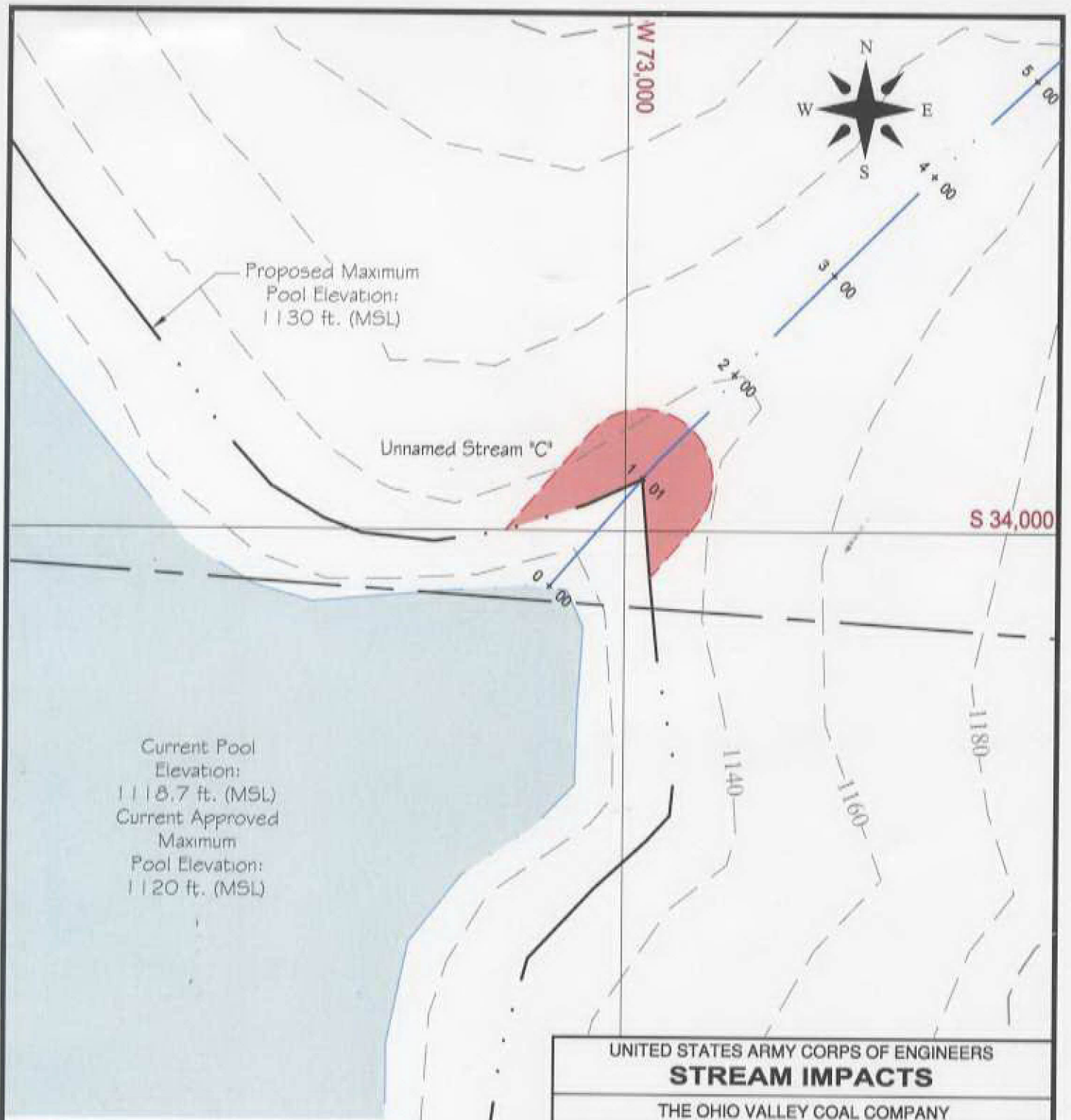
Revised:

Comm #469-46



342 High St., Box 471
Flushing, Ohio 43977
Ph: (740) 968-4947
Fax: (740) 968-4225
e-mail: hamilton@1st.net
www.hamiltonandassoc.com

469-46StreamImpact2_cwh.dwg



STREAM	AFFECTED BY	BEGINNING STATION	ENDING STATION
Unnamed Stream 'C'	Slurry Impoundment Expansion	0+00	1+01



UNITED STATES ARMY CORPS OF ENGINEERS

STREAM IMPACTS

THE OHIO VALLEY COAL COMPANY

POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION

ODNR PERMIT #: D-0360

ODNR A.R.P. #: R-0360-56

Township: WASHINGTON

County: BELMONT

Page: 5 of 16

Scale: 1"=100'

Date: 02/03/04

Revised:

Comm #469-46



342 High St., Box 471
Flushing, Ohio 43977

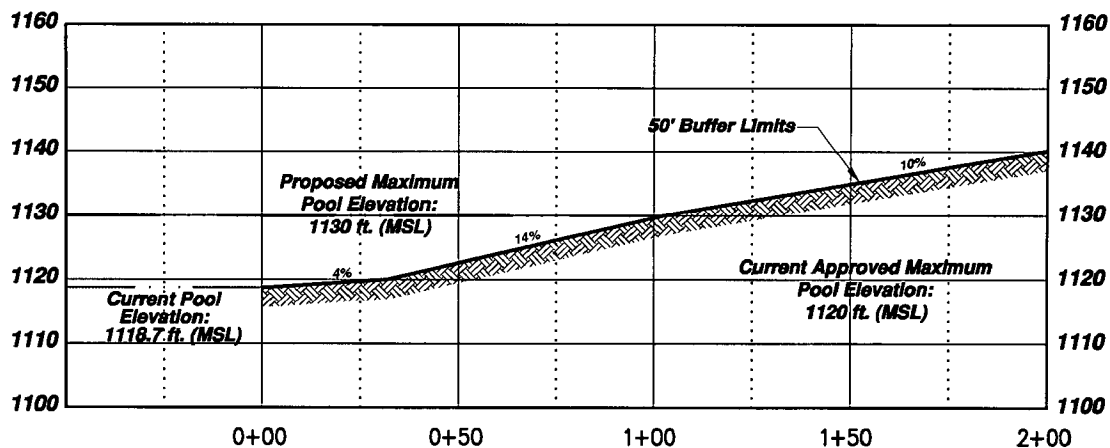
Ph: (740) 968-4947

Fax: (740) 968-4225

e-mail: hamilton@1st.net

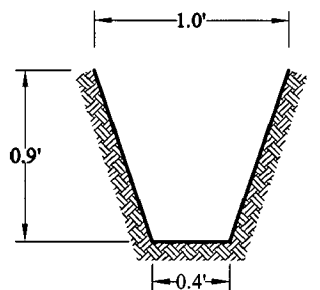
www.hamiltonandassoc.com

469-46StreamImpact3_cwfl.dwg



UNNAMED STREAM "C"

Scale: 1" = 50' Horizontal
1" = 30' Vertical



TYPICAL SECTION UNNAMED STREAM "C"

Not to Scale

UNITED STATES ARMY CORPS OF ENGINEERS

STREAM IMPACTS

THE OHIO VALLEY COAL COMPANY

POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION

ODNR PERMIT #: D-0360

ODNR A.R.P. #: R-0360-56

Township: WASHINGTON

County: BELMONT

Page: 6 of 16

Scale: AS NOTED

Date: 02/03/04

Revised:

Comm #469-46



342 High St., Box 471
Flushing, Ohio 43977
Ph: (740) 968-4947
Fax: (740) 968-4225
e-mail: hamilton@1st.net
www.hamiltonandassoc.com

469-46StreamImpact3_cwh.dwg

W 72,000

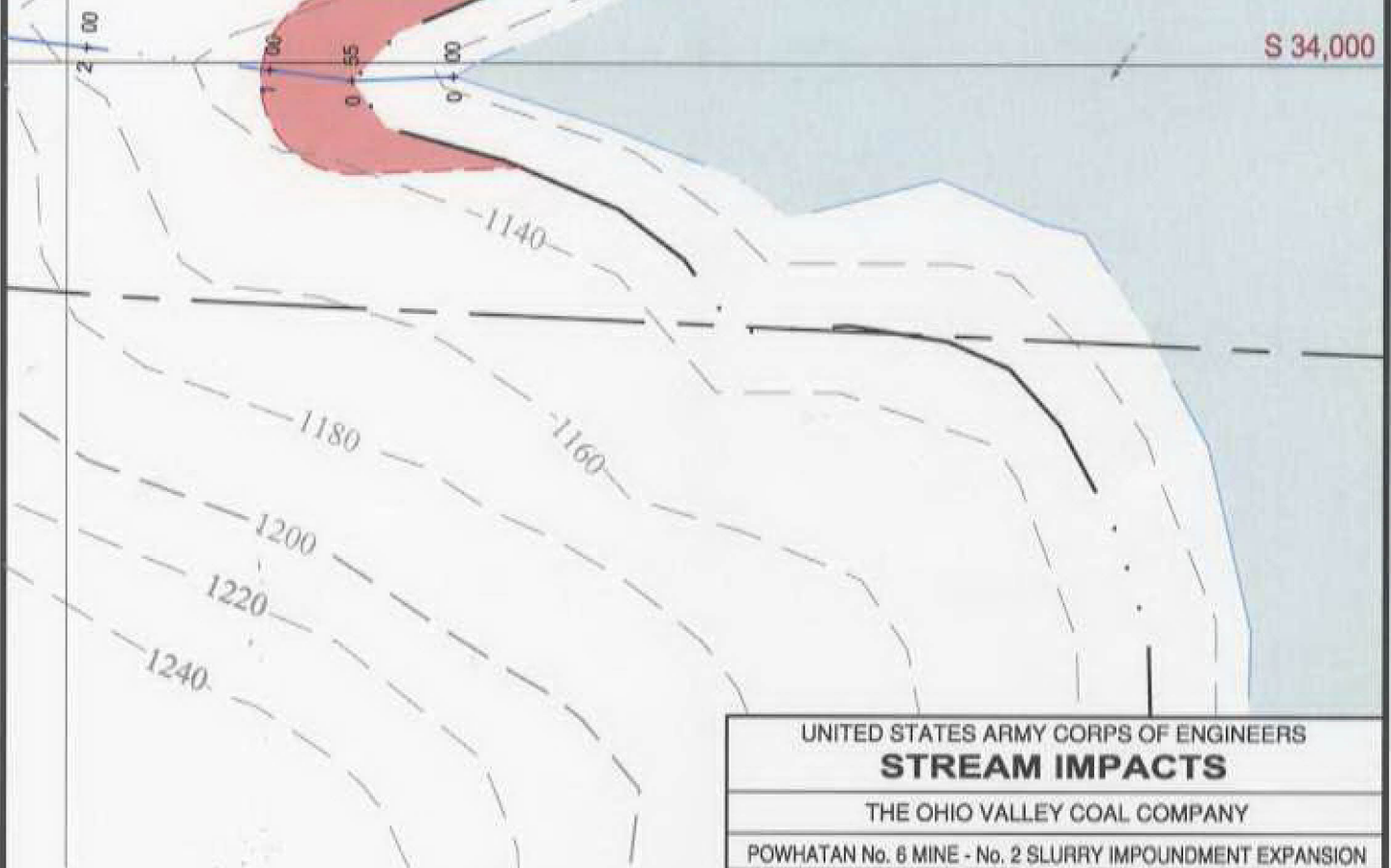


Proposed Maximum
Pool Elevation:
1130 ft. (MSL)

Current Pool
Elevation:
1118.7 ft. (MSL)
Current Approved
Maximum
Pool Elevation:
1120 ft. (MSL)

Ephemeral Channel "E3"

S 34,000



UNITED STATES ARMY CORPS OF ENGINEERS

STREAM IMPACTS

THE OHIO VALLEY COAL COMPANY

POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION

ODNR PERMIT #: D-0360

ODNR A.R.P. #: R-0360-56

Township: WASHINGTON

County: BELMONT

Page: 7 of 16

Scale: 1"=100'

Date: 02/03/04

Revised:

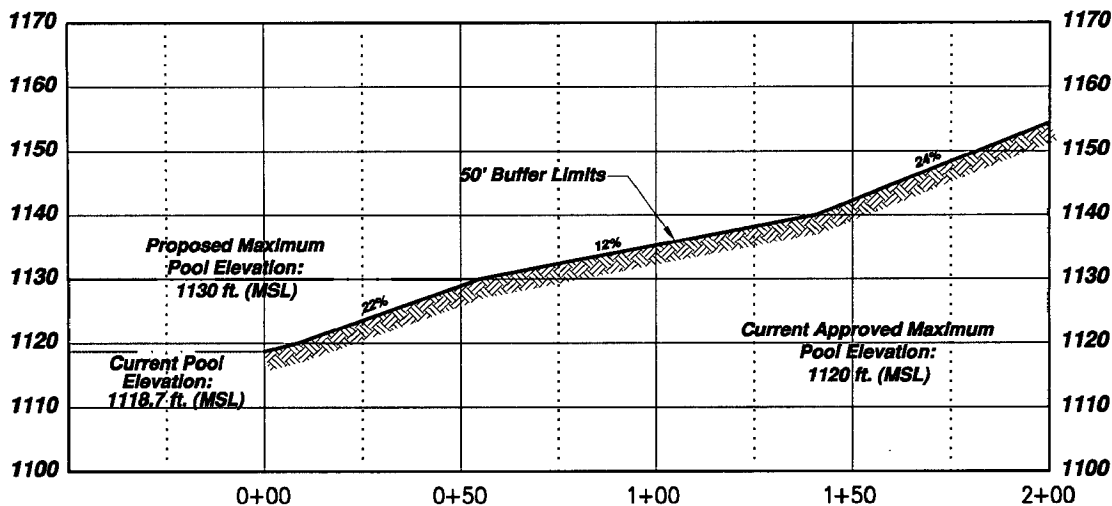
Comm #469-46

STREAM	AFFECTED BY	BEGINNING STATION	ENDING STATION
Ephemeral Channel "E3"	Slurry Impoundment Expansion	0+00	0+55



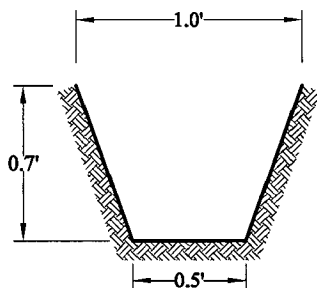
342 High St., Box 471
Flushing, Ohio 43977
Ph: (740) 968-4947
Fax: (740) 968-4225
e-mail: hamilton@1st.net
www.hamiltonandassoc.com

469-46StreamImpact4_cwh.dwg



EPHEMERAL CHANNEL "E3"

Scale: 1" = 50' Horizontal
1" = 30' Vertical



TYPICAL SECTION EPHEMERAL CHANNEL "E3"

Not to Scale

UNITED STATES ARMY CORPS OF ENGINEERS

STREAM IMPACTS

THE OHIO VALLEY COAL COMPANY

POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION

ODNR PERMIT #: D-0360

ODNR A.R.P. #: R-0360-56

Township: WASHINGTON

County: BELMONT

Page: 8 of 16

Scale: AS NOTED

Date: 02/03/04

Revised:

Comm #469-46



342 High St., Box 471

Flushing, Ohio 43977

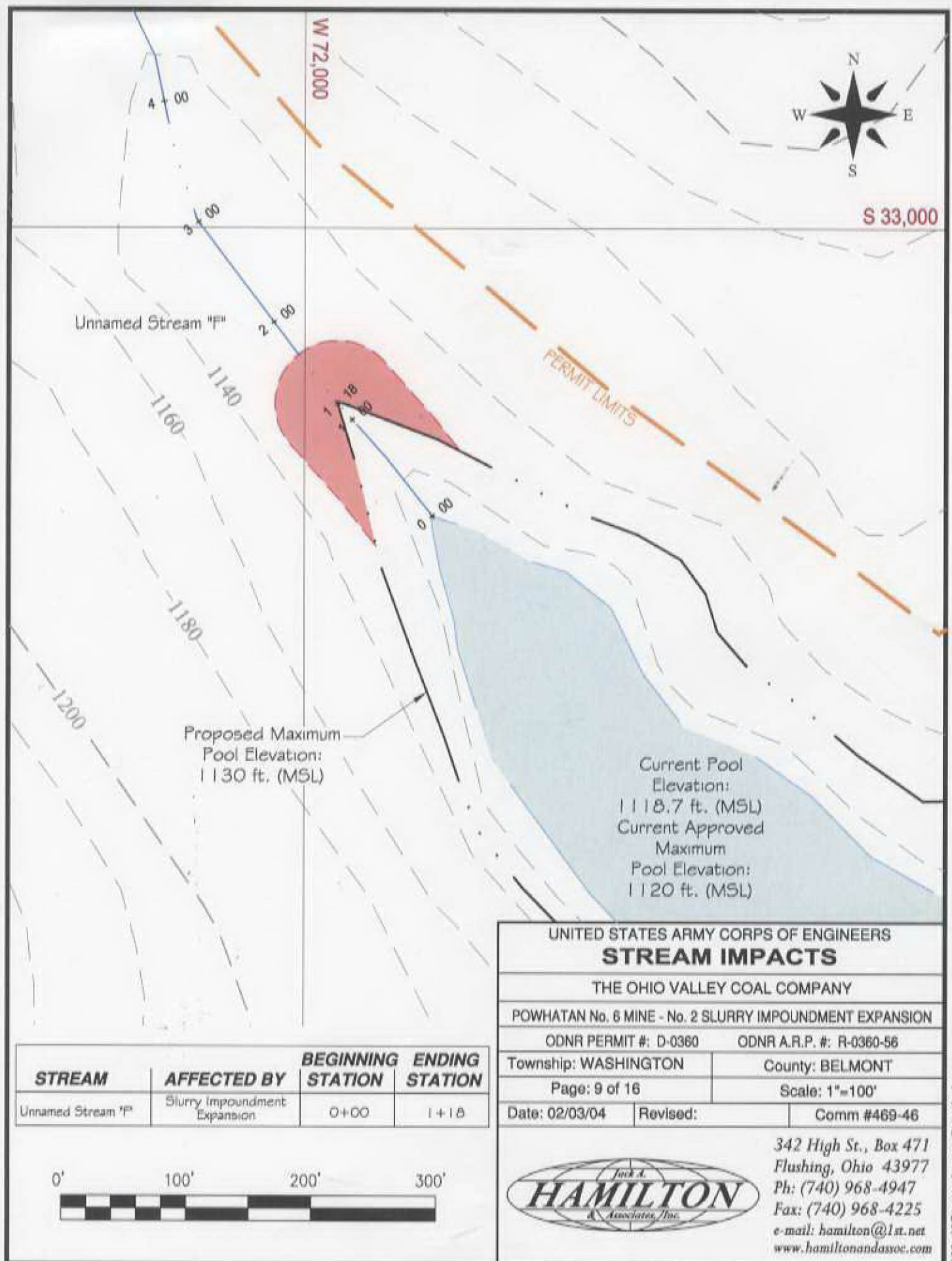
Ph: (740) 968-4947


Fax: (740) 968-4225

e-mail: hamilton@1st.net

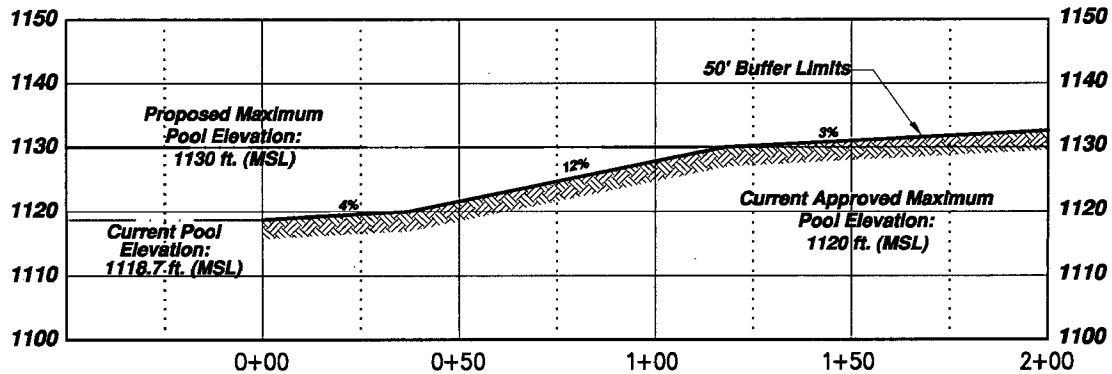
www.hamiltonandassoc.com

469-46StreamImpact4_cwh.dwg



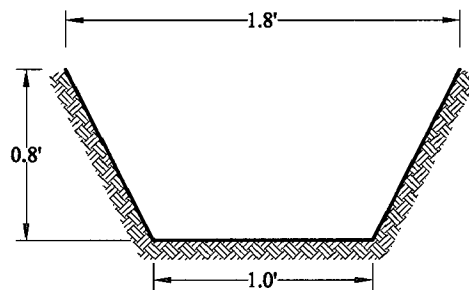
UNITED STATES ARMY CORPS OF ENGINEERS	
STREAM IMPACTS	
THE OHIO VALLEY COAL COMPANY	
POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION	
ODNR PERMIT #: D-0360	ODNR A.R.P. #: R-0360-56
Township: WASHINGTON	County: BELMONT
Page: 9 of 16	Scale: 1"=100'
Date: 02/03/04	Revised:
Comm #469-46	
	
342 High St., Box 471 Flushing, Ohio 43977 Ph: (740) 968-4947 Fax: (740) 968-4225 e-mail: hamilton@1st.net www.hamiltonandassoc.com	

469-46StreamImpact5_cwh.dwg




UNNAMED STREAM "F"

Scale: 1" = 50' Horizontal
1" = 30' Vertical

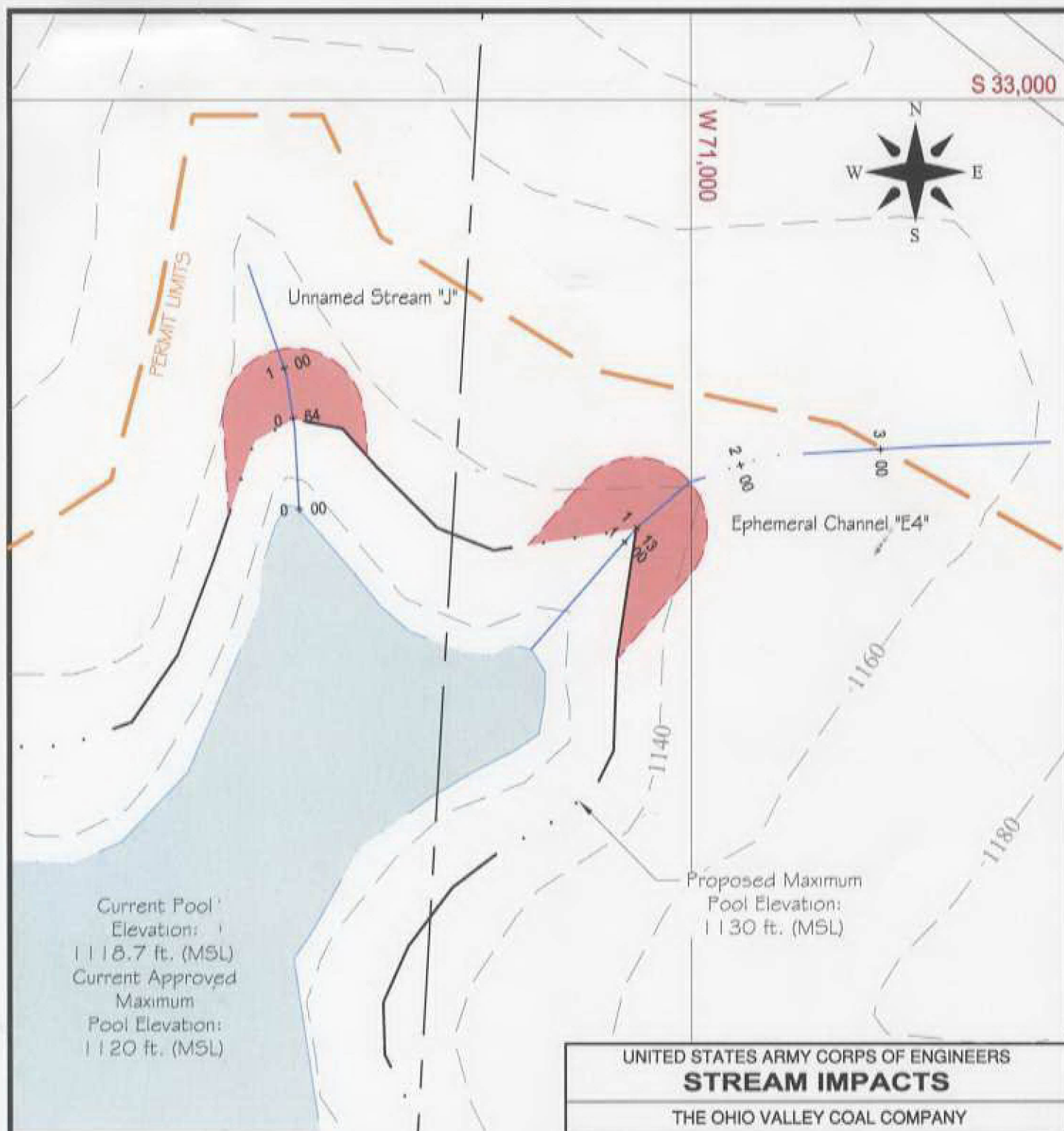


TYPICAL SECTION UNNAMED STREAM "F"

Not to Scale

UNITED STATES ARMY CORPS OF ENGINEERS		
STREAM IMPACTS		
THE OHIO VALLEY COAL COMPANY		
POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION		
ODNR PERMIT #: D-0360		ODNR A.R.P. #: R-0360-56
Township: WASHINGTON		County: BELMONT
Page: 10 of 16		Scale: AS NOTED
Date: 02/03/04	Revised:	Comm #469-46
		342 High St., Box 471 Flushing, Ohio 43977 Ph: (740) 968-4947 Fax: (740) 968-4225 e-mail: hamilton@1st.net www.hamiltonandassoc.com

469-46StreamImpact5_cwh.dwg



Current Pool
Elevation:
1118.7 ft. (MSL)
Current Approved
Maximum
Pool Elevation:
1120 ft. (MSL)

Proposed Maximum
Pool Elevation:
1130 ft. (MSL)

UNITED STATES ARMY CORPS OF ENGINEERS

STREAM IMPACTS

THE OHIO VALLEY COAL COMPANY

POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION

ODNR PERMIT #: D-0360

ODNR A.R.P. #: R-0360-56

Township: WASHINGTON

County: BELMONT

Page: 11 of 16

Scale: 1"=100'

Date: 02/03/04

Revised:

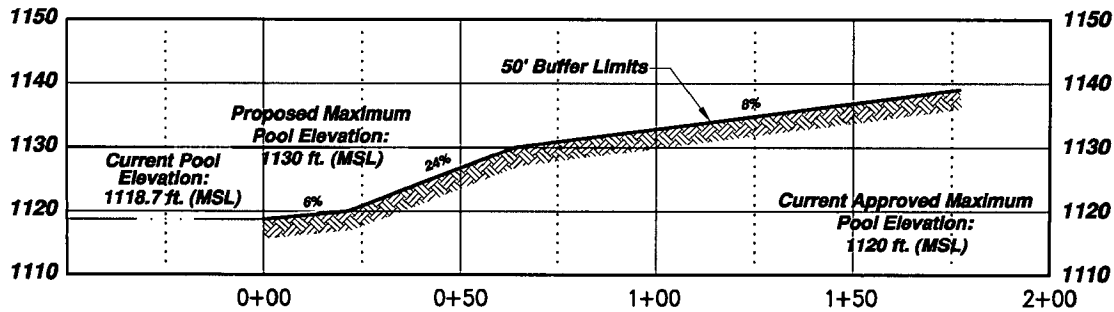
Comm #469-46



342 High St., Box 471
Flushing, Ohio 43977
Ph: (740) 968-4947
Fax: (740) 968-4225
e-mail: hamilton@1st.net
www.hamiltonandassoc.com

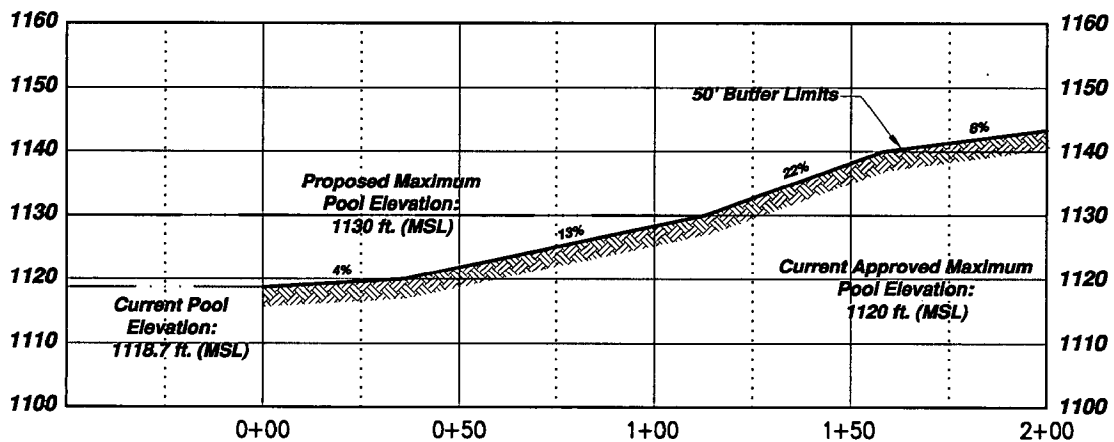
STREAM	AFFECTED BY	BEGINNING STATION	ENDING STATION
Unnamed Stream "J"	Slurry Impoundment Expansion	0+00	0+64
Ephemeral Channel "E4"	Slurry Impoundment Expansion	0+00	1+13





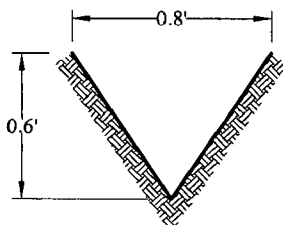
UNNAMED STREAM "J"

Scale: 1" = 50' Horizontal
1" = 30' Vertical



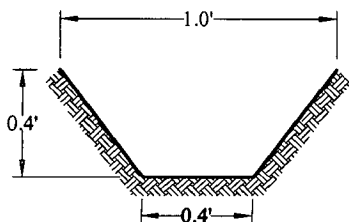
PROFILE EPHEMERAL CHANNEL "E4"

Scale: 1" = 50' Horizontal
1" = 30' Vertical



TYPICAL SECTION
UNNAMED STREAM "J"

Not to Scale



TYPICAL SECTION
EPHEMERAL CHANNEL "E4"

Not to Scale

UNITED STATES ARMY CORPS OF ENGINEERS

STREAM IMPACTS

THE OHIO VALLEY COAL COMPANY

POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION

ODNR PERMIT #: D-0360

ODNR A.R.P. #: R-0360-56

Township: WASHINGTON

County: BELMONT

Page: 12 of 16

Scale: AS NOTED

Date: 02/03/04

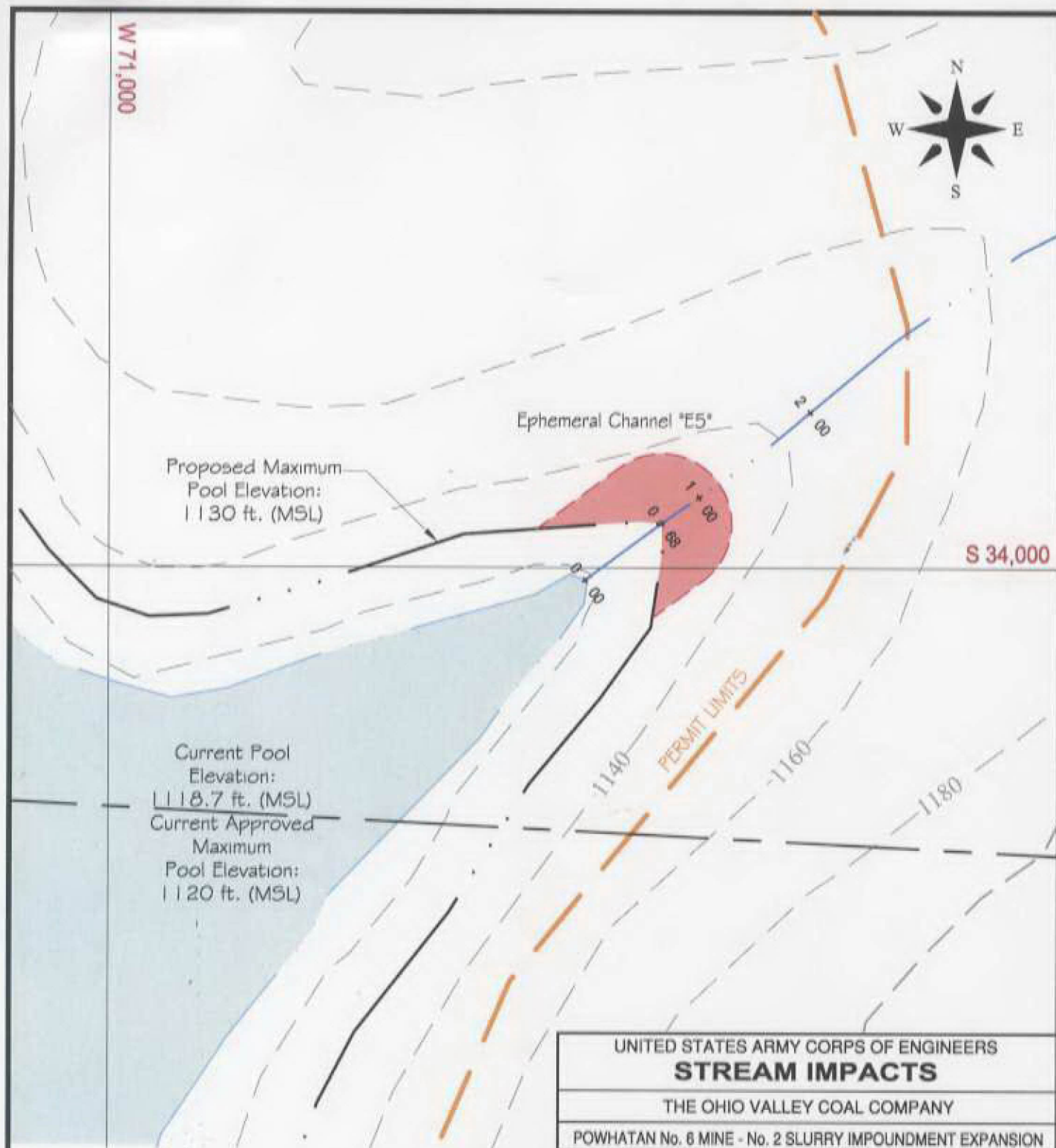
Revised:

Comm #469-46




342 High St., Box 471
Flushing, Ohio 43977
Ph: (740) 968-4947
Fax: (740) 968-4225
e-mail: hamilton@1st.net
www.hamiltonandassoc.com

469-46StreamImpact6_cwh.dwg

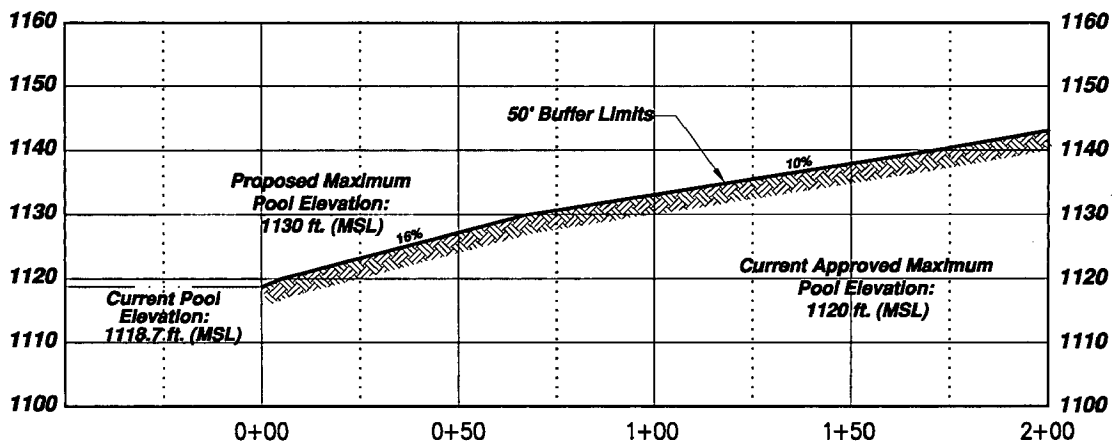


STREAM	AFFECTED BY	BEGINNING STATION	ENDING STATION
Ephemeral Channel *E5*	Slurry Impoundment Expansion	0+00	0+68



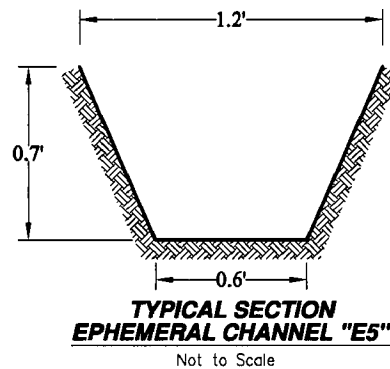
UNITED STATES ARMY CORPS OF ENGINEERS		
STREAM IMPACTS		
THE OHIO VALLEY COAL COMPANY		
POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION		
ODNR PERMIT #: D-0360	ODNR A.R.P. #: R-0360-56	
Township: WASHINGTON	County: BELMONT	
Page: 13 of 16	Scale: 1"=100'	
Date: 02/03/04	Revised:	Comm #469-46
		
342 High St., Box 471 Flushing, Ohio 43977 Ph: (740) 968-4947 Fax: (740) 968-4225 e-mail: hamilton@1st.net www.hamiltonandassoc.com		

469-46StreamImpact7_cvw.dwg



EPHEMERAL CHANNEL "E5"

Scale: 1" = 50' Horizontal
1" = 30' Vertical



UNITED STATES ARMY CORPS OF ENGINEERS

STREAM IMPACTS

THE OHIO VALLEY COAL COMPANY

POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION

ODNR PERMIT #: D-0360

ODNR A.R.P. #: R-0360-56

Township: WASHINGTON

County: BELMONT

Page: 14 of 16

Scale: AS NOTED

Date: 02/03/04

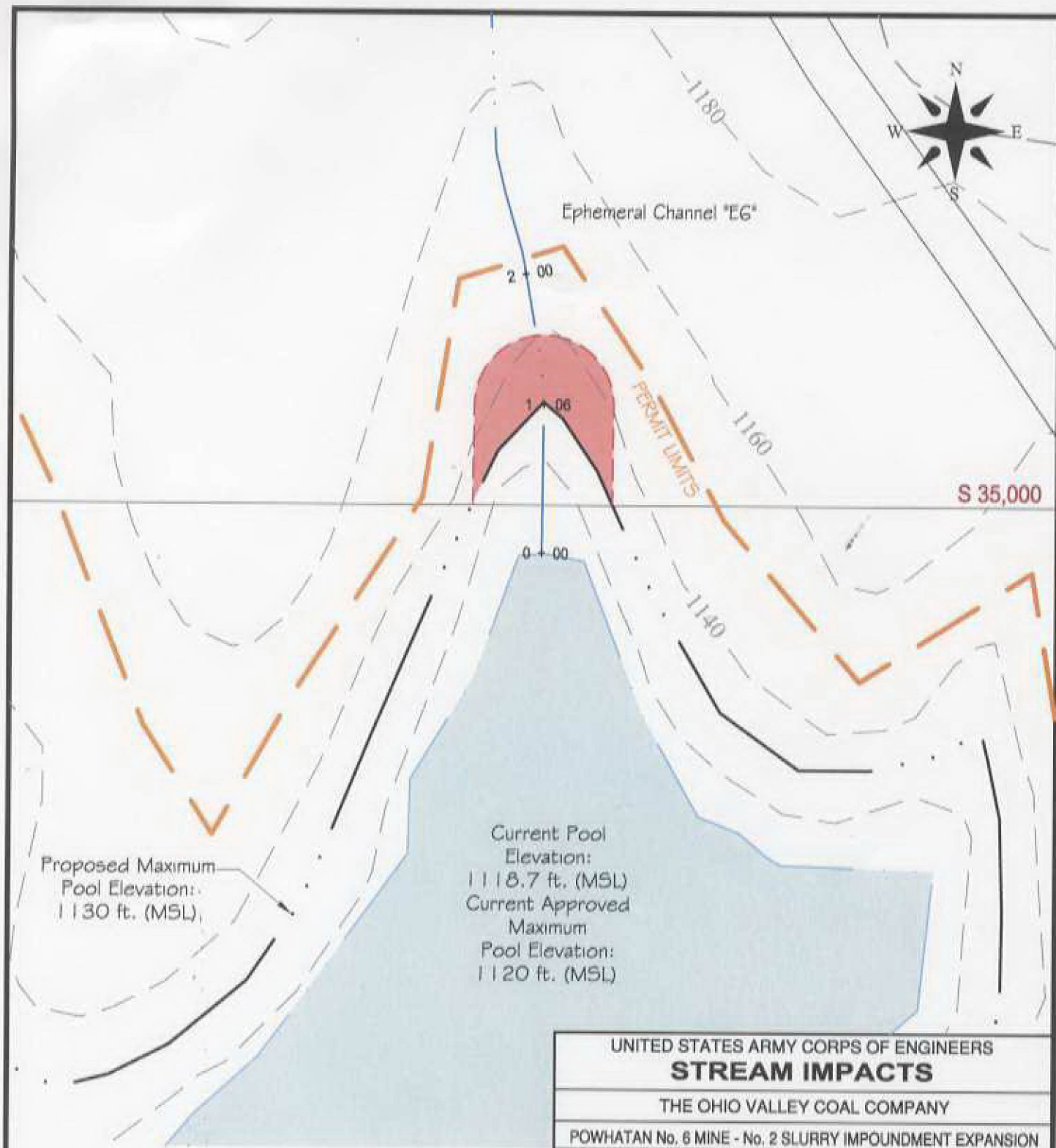
Revised:

Comm #469-46




342 High St., Box 471
Flushing, Ohio 43977
Ph: (740) 968-4947
Fax: (740) 968-4225
e-mail: hamilton@1st.net
www.hamiltonandassoc.com

469-46StreamImpact7_cwh.dwg

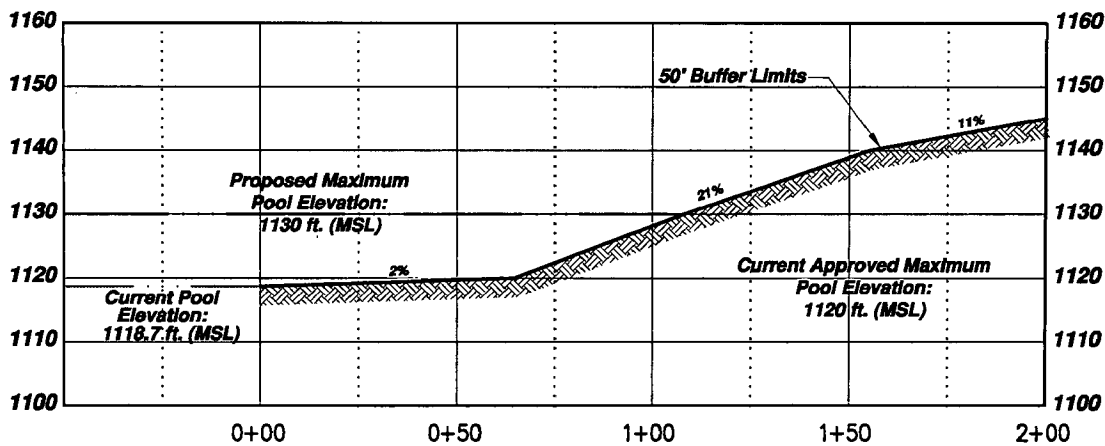


STREAM	AFFECTED BY	BEGINNING STATION	ENDING STATION
Ephemeral Channel *EG*	Slurry Impoundment Expansion	0+00	1+06



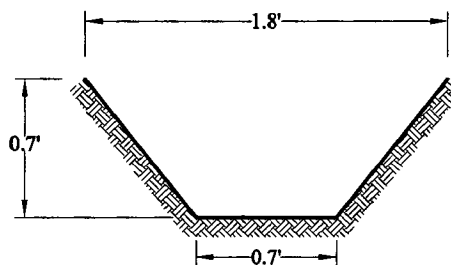
UNITED STATES ARMY CORPS OF ENGINEERS		
STREAM IMPACTS		
THE OHIO VALLEY COAL COMPANY		
POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION		
ODNR PERMIT #: D-0360		ODNR A.R.P. #: R-0360-56
Township: WASHINGTON		County: BELMONT
Page: 15 of 16		Scale: 1"=100'
Date: 02/03/04	Revised:	Comm #469-46
		342 High St., Box 471 Flushing, Ohio 43977 Ph: (740) 968-4947 Fax: (740) 968-4225 e-mail: hamilton@1st.net www.hamiltonandassoc.com

469-46StreamImpact8_cwh.dwg



EPHEMERAL CHANNEL "E6"

Scale: 1" = 50' Horizontal
1" = 30' Vertical



**TYPICAL SECTION
EPHEMERAL CHANNEL "E6"**

Not to Scale

UNITED STATES ARMY CORPS OF ENGINEERS

STREAM IMPACTS

THE OHIO VALLEY COAL COMPANY

POWHATAN No. 6 MINE - No. 2 SLURRY IMPOUNDMENT EXPANSION

ODNR PERMIT #: D-0360

ODNR A.R.P. #: R-0360-56

Township: WASHINGTON

County: BELMONT

Page: 16 of 16

Scale: AS NOTED

Date: 02/03/04

Revised:

Comm #469-46



342 High St., Box 471
Flushing, Ohio 43977
Ph: (740) 968-4947
Fax: (740) 968-4225
e-mail: hamilton@1st.net
www.hamiltonandassoc.com

469-46StreamImpact8_cwh.dwg



COAL MINING AND RECLAMATION PERMIT APPLICATION TO REVISE A PERMIT (ARP)

Issued To: OHIO VALLEY COAL CO
56854 PLEASANT RIDGE ROAD
ALLEDONIA, OH 43902

Permit Number: D-360
Application Number R-0360-56

Telephone: (740) 926-1351

Effective: 08/20/2004
Expires: 06/19/2004

ARP Type:

Stream Buffer Zone Variance Request (BZVR)
Revise Refuse Disposal Plan
Revise Probable Hydrologic Consequences (PHC)

The issuance of this ARP means only that the application to conduct a coal mining operation meets the requirements of Chapter 1513 of the Revised Code, and as such DOES NOT RELIEVE the operator of any obligation to meet other federal, state or local requirements.

This ARP is issued in accordance with and subject to the provisions, conditions, and limitations of Chapter 1513 of the Revised Code and Chapters 1501:13-1, 1501:13-3 through 1501:13-14 of the Administrative Code.

The approved water monitoring plan for this ARP is:

Quality: N/A

Quantity: N/A

Note: Any previous condition(s) imposed on this permit, or subsequent adjacent areas, also apply to this ARP unless noted otherwise.

Signature: Michael Y. Spensley, Jr.
Chief, Mineral Resources Management

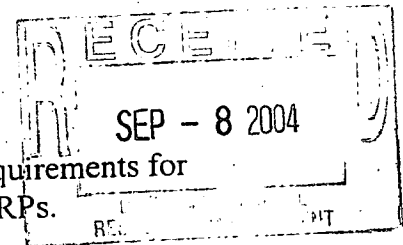
Date: 08/20/2004

2/96

☒ New Submittal
☐ Revised Submittal R- 360-56

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

APPLICATION TO REVISE A COAL MINING PERMIT



Note: Refer to the Division's "General Guideline for Processing ARPs" and "Requirements for Specific Types of Common ARPs" for guidance on submitting and processing ARPs.

1. Applicant's Name THE OHIO VALLEY COAL COMPANY
Address 56854 PLEASANT RIDGE ROAD
City ALLEDONIA State Ohio Zip 43902
Telephone Number 740 - 926 - 1351
2. Permit Number D-0360

3. Section of mining and reclamation plan to be revised:

PART 3, PAGE 23, ITEM A(14)(a)

4. Describe in detail the proposed revision and submit any necessary drawings, plans, maps, etc.:

THIS REVISION INCLUDES CHANGES TO THE REFUSE DISPOSAL PLAN -
RAISING NO. 2 SLURRY IMPOUNDMENT. SEE ADDENDUM TO ITEM 4

5. Describe in detail the reason for requesting the revision:

THIS REVISION INCLUDES PHC AND STREAM BUFFER ZONE VARIANCE
REQUEST - SEE ADDENDUM TO ITEM 4

6. Will this revision constitute a significant alternation from the mining and reclamation operation contemplated in the original permit? ☐ Yes, ☒ No.
(Note: refer to paragraph (E) (2) of 1501:13-04-06 of the Ohio Administrative Code to determine if a revision is deemed significant.)

If "yes," complete the following items 7 through 9.

OPERATOR

7. In the space below give the name and address of the newspaper in which the public notice is to be published.

N/A

8. In the space below give the text of the public notice that is to be published. (Include the information required by paragraph (A)(1) of 1501:13-05-01 of the Ohio Administrative Code.)

N/A

9. In the space below give the name and address of the public office where this application is to be filed for public viewing.

N/A

I, the undersigned, a responsible official of the applicant, do hereby verify the information contained in this revision request is true and correct to the best of my information and belief.

DAVID L. BARTSCH

Print Name

David L. Bartsch

Signature

7-14-03

Date

Env. Coord.

Title

Sworn before me and subscribed in my presence this 14th day of July, 20 02

Penny J. Elliott

Notary Public



PENNY J. ELLIOTT, Notary Public
For The State of Ohio
Commission Expires February 11, 2008
Recorded in Monroe County

APPROVED

FOR DIVISION USE ONLY

This request is hereby

Michael J. Honsky

Chief, Division of Mines and Reclamation

8-20-04

Date

ARP TO RAISE NO. 2 SLURRY IMPOUNDMENT

Since 1975, the No. 2 Slurry Impoundment has served as the disposal facility for the fine refuse from the mine. This impoundment is reaching the end of its life and another facility is under design. However, to assure that the operation continues without interruption during the remainder of the design and permitting phases prior to operation of the new impoundment, it will be necessary to raise the No. 2 Impoundment another 10 ft.

Currently, the embankment has a crest elevation of 1125 ft and the water level is at elevation 1119.5 ft. The ultimate crest elevation currently is planned to be 1130 ft with maximum normal pool elevation 1120 ft. Under the design storm conditions (Probable Maximum Flood - PMF) the pool is designed to rise to elevation 1127 ft.

This proposal is to raise the embankment to elevation 1140 ft and the maximum normal pool to elevation 1130 ft. Under the design storm conditions the pool is designed to rise to elevation 1137 ft.

The ARP map shows the current pool elevation, the current maximum normal pool elevation, and the proposed normal pool elevation. This revision will allow another 2 ½ years of slurry disposal at the No. 2 Impoundment.

PROBABLE HYDROLOGIC CONSEQUENCES

The Probable Hydrologic Consequences (PHC) for the Powhatan No. 6 Mine originally were described in Addendum No. 9 (Addendum to Part 2, Item E) (copy enclosed). Since the time that the original PHC was written in 1984, 19 years have elapsed. The original PHC predicted the following consequences:

1. A reduction in rate of surface runoff to Captina Creek and tributaries due to collection and retention in ponds and impoundments;
2. Local increases in runoff (both rate and quantity) due to barren and impervious surfaces associated with mine operations;
3. Local increases in infiltration to shallow aquifers due to seepage from ponds and impoundments, and increased infiltration resulting from reduced vegetative cover;
4. Increased base flows in Captina Creek and tributaries resulting from increased infiltration identified in item 3 above;
5. No significant net change in water quantity within or near the permit area because there

OPERATOR

ADDENDUM TO ARP ITEM 4
THE OHIO VALLEY COAL COMPANY
PERMIT D-0360
PAGE 2

are no identified significant additions to or withdrawals from the hydrologic system; and

6. No significant changes in water quality within and near the permit area since sediment controls and water treatment are operated in accordance with regulation requirements.

In the time period since this PHC was written, Ohio Valley has had the opportunity to evaluate the predicted consequences. Those evaluations show:

1. While instantaneous changes in the rate of surface runoff may occur, the overall result is that no net change occurs as the ponds discharge the runoff in a more controlled manner.
2. The ponds help to buffer the increases in runoff due to barren and impervious surfaces. Water treatment maintains good water quality when needed.
3. Local increases in infiltration have not been documented as the ponds have clay liners that impede infiltration.
4. Increased base flows in Captina Creek have not been documented.
5. There has been no net change in water quality as predicted.
6. The treatment facilities at the No. 6 Mine have maintained the water quality in accordance with regulation requirements. In fact, since the mine was installed in 1972, Captina Creek has earned a designation of Exceptional Warm Water Habitat, the highest designation for a stream in Ohio. In fact, one endangered species was found to exist downstream of the No. 6 Mine (Eastern Hellbender) attesting to the fact that the water quality is not degraded.

In 1999, the adjacent coarse refuse pile was completed and a new coarse refuse pile was located immediately downstream of the No. 2 Slurry embankment. The placement of this coarse refuse serves to buttress the embankment. All runoff from this new pile is directed into a sediment pond (Pond 13) and soon will be directed into a second sediment pond (Pond 14). In addition, all seepage (approximately 40 gallons per minute) from this pile is directed to pond 13.

As the pile is raised, the face is topsoiled and seeded, removing additional sediment load from the pond and keeping levels of iron and manganese low. The new site has an underdrain system, a clay liner, and a leachate collection system located under the refuse and above the clay liner. Quarterly monitoring shows that there is no degradation of groundwater occurring. Quarterly monitoring of the streams show that there is no degradation of the surface water. This monitoring is expected to continue throughout the life of this permit. Seasonal variations in water quality may be seen in elevated levels of some metals. This variation is due to dilution caused by increased runoff. Quarterly monitoring reports are enclosed.

The PHC for the new coarse refuse pile (Approved application D-0360-8. Design Plans. Section 7.3) (copy enclosed) indicates the following:

"The proposed facility has the potential to produce acid drainage as well as high concentrations of suspended and dissolved solids, and metals such as iron and manganese. The construction, operation, maintenance, water monitoring and reclamation proposed are designed to mitigate or eliminate these effects. Consequently, there are no significant adverse impacts on the surface water, groundwater regime, or hydrologic balance either on or off the site." Since the beginning of the facility until now, suspended solids, dissolved solids, and iron and manganese have been controlled through the maintenance of treatment and sediment controls. To date, Soda Ash (pH, iron and manganese control) and gel logs (suspended solids and iron) have been used to treat the water in Pond 13. The pond and the sump leading to it are cleaned several times a year to maintain the structures and to stay in compliance.

The proposed revision to raise the No. 2 Slurry Impoundment will have a no additional effect to the hydrology of the area. The probable hydrologic consequences of this proposal are:

1. Temporary reduction in rate of surface runoff to Captina Creek and tributaries due to collection and retention in ponds and impoundments. However, this reduction is offset by controlled introduction of the water in the ponds after sediment and other pollutants are removed due to treatment and retention time.
2. Local increases in runoff (both rate and quantity) due to barren and impervious surfaces associated with mine operations. However, this increased flow is intercepted by the drainage control structures (ponds and impoundments) as described in item 1 above.
3. No significant net change in water quantity or quality. Treatment facilities are operated in accordance with regulation requirements.

CONSTRUCTION

The construction required to raise the No. 2 Slurry Impoundment 10 ft involves the same placement and compaction of coarse mine refuse in 12-in. lifts. Compaction of 95 percent of standard proctor is required for this construction. In order to limit seepage through the embankment, the new construction is to have a minimum width of 100 ft at the highest point. The cutoff trenches will need to be extended another 10 ft vertically. The emergency spillway was excavated and a control sill was installed at elevation 1122.5 ft. A concrete wall will be needed to handle the design storm. This structure will be an inverted "t" shape. The engineering analysis for this structure is enclosed. This report was submitted for review to MSHA and Ohio Division of Water, Water Management Section.

PART 3, PAGE 24, ITEM D(5)

All topsoil material will be removed from the area to be affected by the proposed maximum water level.

STREAM BUFFER ZONE VARIANCE REQUEST

In October 1980, a stream buffer zone variance request (copy enclosed) was approved for this drainage (Perkins Run) (copy enclosed). The approval was given with two conditions:

1. The waterway(s) shall be separated from the disturbed area by a dike or diversion that will direct surface drainage through a treatment system prior to entering the waterway(s).
2. Areas between waterway(s) and dike or diversion must be protected from erosion and kept free of all acid or toxic-forming materials.

These conditions will continue to be met.

Per PPD Permitting and Hydrology 98-1, see attached updated B.Z.V.R. addressing additional impacts to all streams (as indicated by the June 30, 2003 Army Corp of Engineers letter).

OHIO EPA AND US ARMY CORP OF ENGINEERS CONCURRENCE

Both the Ohio EPA and the US Army Corp of Engineers have sent letters verifying that this work can be authorized under the Nationwide 21 Permit. Copies of their letters are enclosed. A Nationwide 21 Permit application has been submitted to the US Army Corp of Engineers.

MSHA AND DIVISION OF WATER CONCURRENCE

Both the Mine Safety and Health Administration and the Ohio Division of Water (Water Management Section) have been consulted with the plans for the vertical expansion of the embankment.

NO. 2 SLURRY DAM
ENGINEER REVIEW RESPONSES

The design of the embankment for No. 2 dam was submitted to the Division in an ARP when the dam was modified several years ago (*Final Design Report, Modifications to Slurry Dam No. 2* dated February 1990 by DLZ Corporation – formerly Mason-Deverteuil Geotechnical Services).

1. The anticipated additional storage volume from EL 1120 to EL 1130 is 1634 acre-ft. The volume at elevation 1120 was calculated and is available in the. This design report was submitted to the Division in an ARP when the dam was modified several years ago (see *Final Design Report*). The same engineer for raising No. 2 Dam calculated the volume at elevation 1130. The current rate of infilling is approximately 284 acre-ft per year from the Powhatan No. 6 Mine and approximately 335 acre-ft per year from the Century Mine for a total infilling rate of approximately 619 acre-ft per year. Therefore it is anticipated that the increase storage capacity will last for a minimum of 2.5 years, at which time the No. 3 slurry impoundment (currently being permitted) will be started.
2. The current embankment plans are anticipated to meet its maximum capacity during the late fall of 2004. With the proposed raised embankment the life expectancy is anticipated to last till the late spring or early summer of 2007.
3. The proposed embankment modifications of the No. 2 slurry dam will be an extension of the current slopes as outlined in the *Final Design Report, Modifications to Slurry Dam No. 2* dated February 1990. This design report was submitted to the Division in an ARP when the dam was modified several years ago (originally). The structural stability of these embankments is discussed within the design report, which also will be valid for the proposed embankment modifications.
4. The materials underlying the proposed embankment modifications have been placed at a minimum of 95% of the maximum dry density as determined by the standard proctor. Some settlement may occur over time as the materials consolidate. Testing performed on the coarse coal refuse material during the 1990 modification design indicated that a cohesion value ranged from 1500 to 2000 psf for material compacted to 95% of the maximum dry density. Based on these strength values a bearing capacity failure is not anticipated (see *Final Design Report*).
5. Seepage was addressed for the existing embankment in the *Final Design Report, Modifications to Slurry Dam No. 2* dated February 1990. This design report was

submitted to the Division in an ARP when the dam was modified several years ago originally. These rates will be slightly higher with the additional hydrostatic forces that will result from the proposed modifications. However, Perkins Run is being utilized as a coarse coal refuse disposal area immediately downstream of the No. 2 Slurry Dam. Consequently, disposal fill is being placed against the downstream face resulting in an embankment section that is several hundred feet thick. Seepage (if any) exiting from the downstream fill will be negligible.

6. Breakthrough into the underground mine was addressed in documents previously submitted to the Division. Breakthrough into the underground mine is not considered to be likely. (see Final Design Report)
7. The narrative has been changed.
8. No portions of the approved permit (D-0360-8) will need to be modified.
9. At this time, the elevation of the coarse coal refuse is approximately 1125-1130 ft msl. As the mine continues to operate, OVCC will assure that the refuse is kept above the elevation of the water at all times.
10. The current emergency spillway has been excavated into bedrock that is resistant to erosion. The proposed spillway control sill will also be installed into the foundation bedrock of the existing spillway. Additionally, the proposed spillway control sill has an 8-foot long concrete splash plate that abuts against the existing concrete control sill. Therefore, any water that flows over the top of the proposed spillway control sill will impact against the concrete structure prior to flowing on top of the bedrock.
11. The decant structure will be extended from the existing structure upslope on the right abutment maintaining the existing 24% pipe slope. The extension will be the same size, shape, and design as the existing structure. The bottom and sides of the existing structure shall be chipped $\frac{1}{4}$ to $\frac{1}{2}$ -inch to create a roughened surface. The roughened surface shall be coated with a bonding agent before placing any new concrete. New concrete shall have a minimum compressive strength of 4000 psi at 28 days. The top of the decant shall consist of pre-cast reinforced concrete stop-logs that can be grouted in-place to control the pool elevation. For construction details refer to DLZ Plan Sheets 9 and 10 of the plans submitted with the ARP originally.
12. The cut-off trenches are the same as those outlined in the *Final Design Report*,

Modifications to Slurry Dam No. 2 dated February 1990. The cut-off trench extensions will be started within the existing cut-off trenches already installed within the existing embankment and placed into the ridgeline under the proposed embankment modification. The cut-off trenches will be extended into competent bedrock and backfilled with coarse coal refuse to at least 95% of the standard proctor value. The compacted coarse coal refuse will act to reduce seepage at the embankment/bedrock interface. The cutoff trench details were previously submitted with the ARP for raising No. 2 Dam originally.

13. A plan showing the proposed embankment modifications in relation to the Perkins Run disposal area is shown on DLZ Plan Sheet 4 attached. The impoundment area for the proposed modifications is shown on DLZ Plan Sheet 3 attached. For the location of the original toe and of slope locations please refer to the *Final Design Report, Modifications to Slurry Dam No. 2* dated February 1990 submitted previously when No. 2 Dam was raised originally (ARP).
14. The embankment will be raised in such a manner that the slurry is always kept a minimum of 100 ft from the outslope. However, the drawing entitled Embankment Cross Sections shows the width of the crest to be 40 ft. The Addendum to Item 4 has been revised for consistency.
15. A seepage blanket consisting of compacted coarse coal refuse will be placed upstream of the proposed spillway control sill. Coarse coal refuse will be placed in 8-inch loose lifts and compacted to 95% of the maximum dry density of the material. The fill will be placed to elevation 1130 and extend 60 feet upstream of the proposed spillway control sill. The proposed spillway control sill will extend into the spillway sidewalls and a key will be placed into the foundation bedrock. These features will be poured directly against the cut bedrock with waterstops placed at all joints to minimize seepage.
16. This dimension was a typographical error and has been corrected. The corrected value is shown on DLZ Plan Sheet 5 attached.
17. The proposed embankment modifications of the No. 2 slurry dam will be an extension of the current slopes as outlined in the *Final Design Report, Modifications to Slurry Dam No. 2* dated February 1990. This design report was submitted to the Division in an ARP when the dam was modified several years ago. The slope stability of the embankment is discussed within the design report, which also will be valid for the proposed embankment modifications. The downstream buttress has been ignored in this analysis as it did not exist at the time

of the original modification. That buttress further decreases the likelihood of slope failure.

18. The embankment will be monitored during construction and post-construction for settlement through the use of survey points across the embankment. These survey points will be referenced to control points established outside of the work limits in areas known to be stationary.
19. The spillway and the spillway control section are 50-foot in width. The spillway control sill is 90-foot in width so that the sides will extend into the spillway sidewalls to act as a key to reduce seepage around the ends of the wall.
20. The geologic conditions of the No. 2 Slurry Dam and the impoundment area are discussed in detail in the *Final Design Report; Modifications to Slurry Dam No. 2* dated February 1990 (submitted in an ARP previously). Only minor seepage has been periodically noted within the inundation area, except along the right abutment. These areas along the right abutment are currently being addressed through seepage control measures that will be extended upslope as needed with the proposed embankment modifications. Underground mining has been performed within the area in the past. A description of these activities and the pillars sizing and discussed within the *Final Design Report; Modifications to Slurry Dam No. 2* dated February 1990 (submitted in an ARP previously).
21. Yes.
22. Raising the No. 2 Dam to the 1130-ft surface elevation will create a pond area of 175.11 acres. Allowing for two-percent crown slopes in the reclamation plan, the estimated reclamation or re-soiled surface is approximately 177 acres. The required unit thickness and total volume of re-soiling material in descending order of placement, is as follows: Vegetative cover soil, six inches thick, 88.5 acre-feet; Clay cap, twenty-four inches thick, 354 acre-feet; and inert earthen fill, eighteen inches, 265.5 acre-feet. This material will be sourced in two ways: First from the No. 2 Dam perimeter between the current pond elevation of 1119 feet to the requested pond elevation of 1130 feet, which is 13.22 acres; and Second, from the three borrow areas permitted adjacent to the No. 2 Dam, as shown on the D-0360-8 Permit Application and Hydrology Map. The borrow areas contain 129.4 acres which were permitted for the reclamation requirements of the No. 2 Dam. It is estimated these combined areas contain 143 acre-feet of vegetative cover soil, 572 acre-feet of low permeability clay, and over 1100 acre-feet of inert earthen material, all of which will provide adequate cover and cap material for

reclamation of the No. 2 Dam. Please refer to Appendix 5, Soils and Geotechnical Testing Data, in the Hydrogeologic Investigation Report for the Perkins Run Coarse Coal Refuse Disposal Facility (D-0360-8), dated February 2000.

23. Please refer to enclosed Drawing No. 3, Interim Closure Plan - Perkins Run Coal Refuse Facility, and Drawing No. 4, Cross-Sections - Perkins Run Coal Refuse Facility.
24. DLZ has reviewed and discussed the design of the concrete spillway accounting for the PMF event at elevation 1135.35 and believes that the current design is adequate for the hydrostatic forces of any water that may flow over the section.
25. The emergency spillway has been excavated into bedrock with very thin overburden materials present at the ground surface. Any flow that would occur within the spillway due to a PMF event should be contained within the bedrock portion of the channel. As such the bedrock channel should be resistant to erosion of any PMF flow that may occur.

THE OHIO VALLEY COAL COMPANY
PERMIT D-0360
ADDENDUM TO ARP TO RAISE NO. 2 SLURRY IMPOUNDMENT 10 FT

1. When raw coal is removed from the mine, it contains a certain amount of rock that must be removed. It is removed in a wet process by use of specific gravity. The rock that is removed is in one of two forms, coarse coal refuse and slurry. The coarse coal refuse is disposed in a refuse pile while the slurry is sent to a slurry pond. At the Powhatan No. 6 Mine, the coarse coal refuse also is used to build the main embankment for the slurry pond and the remainder is placed downstream to buttress (strengthen) it. The D-0360-8 application addressed the coarse coal refuse downstream of the main embankment. The proposal in this ARP is to provide additional storage capacity in the impoundment for slurry. The coarse coal refuse below No. 2 Dam always was projected to be raised to elevation 1150 ft. The only change is the compaction efforts of the refuse will increase as is standard for construction of the impoundment.
2. Table 1 is a compilation of the quarterly monitoring data from a typical year, 2002 for several QMR sampling locations, U6-1 (furthest upstream point) and D-1 (downstream point).

TABLE 1
2002 QMR DATA

U6-1

ANALYTE	UNIT	QUARTER1	QUARTER 2	QUARTER 3	QUARTER 4
FLOW	CFS	125.6	127	7.6	7.6
HARDNESS	MG/L	130	140	180	190
SULFATES	MG/L	46	41	70	96
SPECIFIC CONDUCTANCE	μMHO/CM AT 25° C	510	330	450	1100

D-1

ANALYTE	UNIT	QUARTER1	QUARTER 2	QUARTER 3	QUARTER 4
FLOW	CFS	125.6	134.1	12.4	12.4
HARDNESS	MG/L	140	160	240	220
SULFATES	MG/L	66	75	730	220
SPECIFIC CONDUCTANCE	μMHO/CM AT 25° C	510	510	2200	1700

Table 2 is an analysis of the raw data presented in Table 1. It shows the relationship between flow and concentration by dividing the concentration of the analyte by the flow, denoted as the concentration per unit flow (CONC/UF), (flow is in cfs in this case).

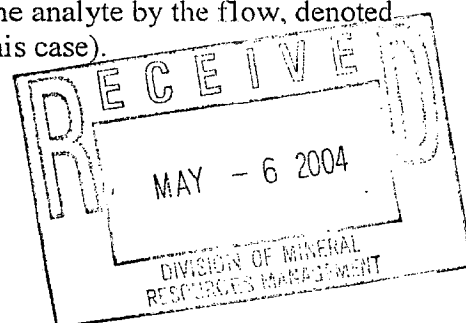


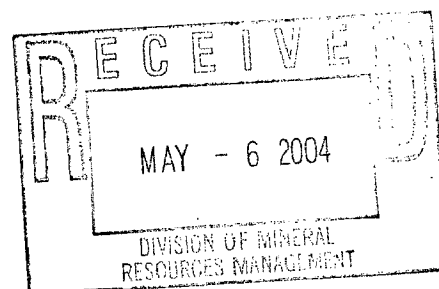
TABLE 2
ANALYSIS OF 2002 MONITORING DATA

U6-1 QUARTER	HARDNESS CONC/UF	SULFATES CONC/UF	SPEC COND CONC/UF
1	1.04	0.37	4.06
2	1.10	0.32	2.60
3	23.68	9.21	59.21
4	25.00	12.63	144.74

D-1 QUARTER	HARDNESS CONC/UF	SULFATES CONC/UF	SPEC COND CONC/UF
1	1.11	0.52	4.03
2	1.19	0.56	3.80
3	19.35	58.87	177.42
4	17.74	17.74	137.10

This analysis clearly shows that as the flow decreases seasonally, the concentration increases by an average of 20.5:1 in the case of hardness, by an average of 75.5:1 for sulfates, and by an average of 51.5:1 for specific conductance. The prediction that seasonal variation in water quality may be seen as elevated levels of some constituents is accurate.

The April 15, 2002 analysis that shows high concentrations of some primary drinking water constituents appears to be an anomaly, as those concentrations did not persist. If there had been some contamination, one would expect the concentrations to be higher in the lower flow conditions, as predicted. This clearly was not the case.





Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

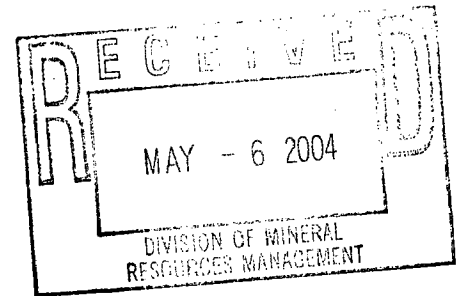
Richard S. Bartz • Chief

Division of Water

January 16, 2004

Mr. David L. Bartsch, P.E.
Environmental Coordinator & Permit Administrator
The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

RE: TOVCCO Slurry Refuse Disposal Dam No. 2
Washington Township, Belmont County
Permit Number 75-087



Dear Mr. Bartsch:

On May 22, 2003, the Division of Water received a letter from you and a design report with plans and specifications from DLZ Ohio, Inc. requesting changes to the approved plans for TOVCCO Slurry Refuse Disposal Dam No. 2 in accordance with Ohio Administrative Code (OAC) Rule 1501:21-15-02. Two copies of the final revisions to the plans and specifications were received on December 12, 2003. An additional copy was received on January 7, 2004. The proposed changes include raising the dam 10 feet, extending the decant structure up the right upstream abutment, and installing a flood wall in the emergency spillway to raise the control section.

Division of Water, Dam Safety Engineering Program staff have reviewed the submitted information and recommended that these proposed changes be approved. Therefore, pursuant to OAC Rule 1501:21-15-02, I am approving the requested changes. These changes will be included as part of Permit Number 75-087.

Enclosed with this letter is one set of the approved revised plans. A separate copy of these plans is being forwarded to the design engineer, Mr. Pete Nix. Please contact Mia Kannik at 614/265-6404 with any questions or comments.

Sincerely,

Richard S. Bartz
Chief, Division of Water

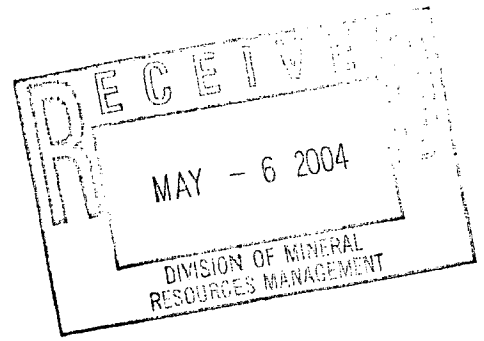
RSB:mpk

cc: Pete Nix, P.E., DLZ Ohio, Inc.
Mia Kannik, P.E., Dam Safety Engineering Program

enclosure

OPERATOR

1939 Fountain Square Court/Building E, Columbus, Ohio 43224



May 4, 2004

The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Attn: Mr. David Bartsch, P.E.

Re: Seepage Analyses and Recommendations
Proposed 10-foot Raise
Slurry Dam No. 2

Mr. Bartsch:

We have completed the seepage analyses for the proposed No. 2 dam section and the Perkins Run Disposal area immediately downstream of the No. 2 embankment. A cross-section of the proposed No. 2 dam section and the disposal facility are attached. As can be seen in the cross-section, the disposal fill placement results in a section approximately 900 feet wide.

When the pool reaches elevation 1130, it is estimated that the seepage flow into the toe drains will be approximately 40 gallons per minute (gpm). The toe drain is large enough to transport this flow, with an adequate factor of safety.

In addition, we have analyzed the combined embankment and disposal refuse section to estimate the amount of seepage that would exit the downstream face of the disposal area. The seepage analysis was performed using the finite-element program FastSeep. The parameters assumed for the various fill materials are shown on the results of the analyses, which are also attached. The analysis also very conservatively assumed that the toe drains was not functioning.

The analysis indicated that the amount of seepage exiting the existing downstream face of the disposal area would be approximately 6 gallons per minute (gpm). This amount of flow is extremely small and unlikely to create a seepage or piping problem. Therefore, we don't believe piping will develop, even if the toe drain ceases to function over time.

Based on the results of the seepage analyses (attached) and the stability analyses (sent under separate cover), raising the pool to elevation 1130 should have no adverse impact on the embankment and the disposal area fill. The existing instrumentation at the project should continue to be monitored and any changes be brought to the attention of DLZ immediately. However, we don't believe that additional monitoring of the project is necessary.



ENGINEERS • ARCHITECTS • SCIENTISTS
PLANNERS • SURVEYORS

Mr. David Bartsch, P.E.
Ohio Valley Coal Company
May 4, 2004
Page 2

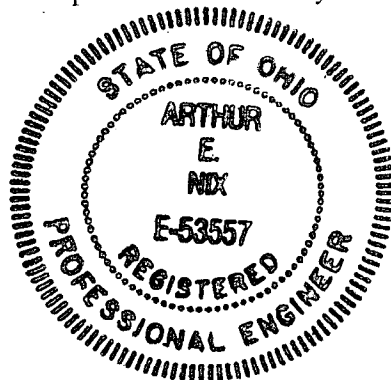
We hope that this information is helpful. Please call if you have any questions.

Sincerely,

DLZ Ohio, Inc.

Arthur Nix / PPP

Arthur (Pete) Nix, P.E.



M:\proj\0321\3002.00\No 2 dam raising recommendaions ltr.doc

HYDROLOGIC DETERMINATION

Permit Area Hydrologic Impacts

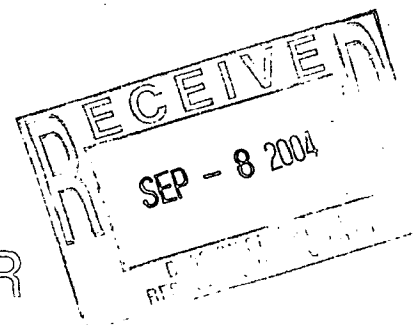
The hydrologic impacts of Powhatan No. 6 can be described by drawing on information and data presented in Addendum Nos. 6, 7 and 8 and Attachment 14. Any changes in water quality as a result of surface operations would appear in the surface water monitoring data for Stations D-1, D-2, and D-3 which in addition to monitoring well W-1, show little or no degradation of water quality.

The refuse disposal area and the No. 2 Slurry Impoundment contribute small amounts of pollutants to Perkins Run in the form of seepage which are so insignificant as not to impact surface water monitoring stations D-2 and D-1. (Please refer to Attachment 14). This seepage will cause a general increase in solids and a decrease in pH in the water discharged from Sediment Pond No. 9 located below the No. 2 Slurry Impoundment. The refuse area is located to the north and adjacent to a refuse embankment which was constructed around 1975. The embankment toe is immediately adjacent to Perkins Run to which it intermittently contributes seepage from the interior of the embankment. Seepage impacts from refuse structures appear negligible in light of data collected from surface water monitoring station D-2 and Well Station W-2. Data for Station D-2 shows consistently low metals content with pH in the range of 7.6 to 8.3 S.U. Data for Station W-3 shows similar acceptable quality.

Permit Area Probable Hydrologic Consequences

The probable hydrologic consequences that can be predicted as a result of operations in the permit area include the following:

OPERATOR



1. A reduction in rate of surface runoff to Captina Creek and tributaries due to collection and retention in ponds and impoundments;
2. local increases in runoff (both rate and quantity) due to barren and impervious surfaces associated with mine operations;
3. local increases in infiltration to shallow aquifers due to seepage from ponds and impoundments, and increased infiltration resulting from reduced vegetal cover;
4. increased base flows in Captina Creek and tributaries resulting from increased infiltration identified in item 3 above;
5. no significant net change in water quantity within or near the permit area because there are no identified significant additions to or withdrawals from the hydrologic system;
6. no significant changes in water quality within and near the permit area since sediment control and water treatment facilities are operated in accordance with regulation requirements. This is confirmed by baseline surface and ground water monitoring data (Attachment 14 forms, Appendix II).

THE OHIO VALLEY COAL COMPANY
POWVIATAN NO. 6 MINE
PERMIT D-0360
QUARTERLY MONITORING REPORT
1ST QUARTER 2002

QUARTERLY MONITORING REPORT FIRST QUARTER 2002										POST MINING										GROUNDWATER WELLS																	
PRE-MINING					X MINING					MONITORING SITE					POST MINING					GROUNDWATER WELLS																	
W-1		W-2		U-1		D-1		D-2		D-3		U6-1		DS6-7		FD-1		FD-2		Pond 13		99-3S		98-5S		00-3S		98-4S		99-1S		99-5S		98-3S			
02/13/02		02/13/02		02/13/02		02/13/02		02/13/02		02/13/02		02/13/02		02/13/02		02/13/02		02/13/02		02/13/02		02/14/02		02/14/02		02/13/02		02/13/02		02/14/02		02/14/02		02/14/02			
Units																																					
ELEVATION																																					
DEPTH BELOW LAND SURFACE																																					
STATIC WATER LEVEL																																					
FLOW																																					
pH																																					
1.0		7.3		7.6		8.8		8.6		8.4		8.8		7.4		7.2		6.9		8.6		9.1		6.6		8.3		6.9		8.9		8.2		6.8			
mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		mg/l		mg/l			
TOTAL ACIDITY		9.1		5.0		ND		ND		1.1		ND		6.5		37		30		1.9		ND		8.4		14		ND		36		ND		ND			
TOTAL ALKALINITY		350		260		110		150		160		120		210		650		710		510		480		160		310		1200		500		360		1600			
TOTAL IRON		ND		0.25		0.08		0.07		ND		0.17		0.09		0.12		5.6		0.26		0.80		3.6		ND		0.05		1.5		0.11		ND			
TOTAL MANGANESE		ND		0.23		0.03		0.06		0.09		0.03		0.02		3.5		6.1		0.33		ND		0.12		0.03		ND		0.46		0.04		0.69			
TOTAL TOTAL SUSPENDED SOLIDS		55		ND		ND		ND		ND		ND		ND		22		13		ND		ND		ND		ND		ND		ND		ND		ND			
TOTAL HARDNESS		510		260		150		140		270		300		46		34		1900		1400		140		110		150		42		2200		310		2.7			
TOTAL SULFATES		1100		530		380		510		670		820		510		430		4000		3300		1200		490		1000		2200		4200		1800		5400			
TOTAL SPECIFIC CONDUCTANCE		1.5		µmhos/cm		0.12		0.12		0.12		0.42		0.42		0.15		0.15		0.22		0.36		0.32		0.42		0.14		0.22		2.8		0.10			
TOTAL NITRATE		0.09		mg/l		0.230		ND		ND		ND		ND		3800		2900		4100		ND		ND		ND		ND		ND		ND		ND			
TOTAL TOTAL DISSOLVED SOLIDS		10		mg/l		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND			
TOTAL ARSENIC		0.001		mg/l		0.02		ND		ND		ND		ND		0.007		0.01		0.01		ND		ND		ND		ND		0.007		0.01		0.02			
TOTAL CADMIUM		0.005		mg/l		ND		ND		ND		ND		ND		0.11		0.10		0.08		ND		ND		ND		ND		0.07		0.10		0.07			
TOTAL CHROMIUM		0.05		mg/l		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		0.05		ND		0.04			
TOTAL LEAD		0.05		mg/l		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND			
TOTAL SELENIUM		0.001		mg/l		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND			
TOTAL COPPER		0.01		mg/l		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		0.02		ND		0.16			
TOTAL ZINC		0.01		mg/l		0.15		ND		ND		0.17		ND		ND		1.1		0.44		ND		ND		ND		ND		0.12		ND		0.16			
TOTAL ALUMINUM		0.10		mg/l		ND		ND		ND		ND		ND		ND		250		180		280		ND		ND		ND		36		140		62			
TOTAL CHLORIDE		0.50		mg/l		ND		ND		ND		ND		ND		ND		900		790		1300		ND		ND		ND		35		580		340			
TOTAL SODIUM		0.02		mg/l		ND		ND		ND		ND		ND		ND		0.38		0.37		1.3		ND		ND		ND		0.05		7.6		0.02			
TOTAL FLUORIDE		0.02		mg/l		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND			
TOTAL SILVER		0.01		mg/l		ND		ND		ND		ND		ND		ND		0.15		0.23		0.17		ND		ND		ND		0.17		0.18		0.09			
TOTAL BARIUM		0.50		mg/l		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND			
TOTAL HEX. CHROMIUM		0.002		mg/l		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND			
TOTAL MERCURY		0.0001		mg/l		ND		0.0049		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		0.0220		ND		ND			
		MDL																																			

ANALYSIS NOT REQUIRED
NOT DETECTED AT MDL: METHOD DETECTION LIMIT

PERMITTEE'S SIGNATURE: David J. Barten DATE: 4-15-02

TRÄDET, INC.

ANALYST'S SIGNATURE: Andrew R. Waske II DATE: 4/9/02
Andrew R. Waske II, General Laboratory Manager

OPERATOR

OHIO DEPARTMENT OF NATURAL RESOURCES DIVISION OF MINERAL RESOURCES MANAGEMENT

THE OHIO VALLEY COAL COMPANY
POWILLATON NO. 6 MINE
PERMIT D-0360
QUARTERLY MONITORING REPORT
2ND QUARTER 2002

PRE-MINING X MINING POST-MINING

MONITORING SITE										GROUNDWATER WELLS									
Units	W-1	W-2	U-1	D-1	D-2	D-3	U6-1	DS6-7	FD-1	FD-2	FD-2	FD-2	FD-2	FD-2	FD-2	FD-2	FD-2	FD-2	FD-2
Date	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02	05/06/02
FT	835	950	840	840	835	830	840	1120	895	895	895	895	895	895	895	895	895	895	895
FT	15	UNK	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FT	12.5	26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CFS	--	--	133.3	134.1	0.32	0.48	127	3.1	8.2	10	10	10	10	10	10	10	10	10	10
pH	7.5	7.7	8.6	8.7	8.1	8.2	8.7	7.5	7.5	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
TOTAL ACIDITY	12	6.8	ND	ND	4.2	4.4	2.1	11	25	45	45	45	45	45	45	45	45	45	45
TOTAL ALKALINITY	330	250	120	120	160	200	110	230	600	670	580	580	580	580	580	580	580	580	580
TOTAL IRON	0.32	0.90	0.19	0.09	2.1	0.08	ND	ND	ND	10.0	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
TOTAL MANGANESE	0.05	0.53	0.07	0.08	0.22	0.13	0.06	0.05	2.9	4.5	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
TOTAL HARDNESS	61	ND	ND	ND	84	ND	ND	ND	ND	8.5	16	16	16	16	16	16	16	16	16
TOTAL SULFATES	360	290	140	160	290	340	140	200	890	460	390	390	390	390	390	390	390	390	390
TOTAL SPECIFIC CONDUCTANCE	770	660	520	510	700	960	330	520	13000	8800	13000	13000	13000	13000	13000	13000	13000	13000	13000
TOTAL NITRATE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL TOTAL DISSOLVED SOLIDS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL ARSENIC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL CADMIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL CHROMIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL LEAD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL SELENIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL COPPER	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL ZINC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL ALUMINUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL CHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL SODIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL FLUORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL SILVER	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL BARIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL HEX. CHROMIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL MERCURY	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MDL	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

ANALYSIS NOT REQUIRED
ND NOT DETECTED AT MDL; METHOD DETECTION LIMIT

PERMITTEE'S SIGNATURE: David L. Bantech DATE: 7-12-02

LABORATORY NAME: TRADET, INC.

ANALYST'S SIGNATURE: Andrew R. Wadko II DATE: 7/5/02
Andrew R. Wadko II, General Laboratory Manager

OHIO DEPARTMENT OF NATURAL RESOURCES DIVISION OF MINERAL RESOURCES MANAGEMENT

THE OHIO VALLEY COAL COMPANY
POWATAN NO. 6 MINE
PERMIT D-0360
QUARTERLY MONITORING REPORT
3RD QUARTER 2002

PRE-MINING X MINING POST-MINING

PRE-MINING		X		MINING		MONITORING SITE										POST MINING										GROUNDWATER WELLS																			
																										PRE-MINING										POST MINING									
																										PRE-MINING										POST MINING									
W-1	W-2	U-1	D-1	D-2	D-3	U6-1	DS6-7	FD-1	FD-2	Pond 13	99-3S	98-3S	00-3S	00-2D	98-4S	99-1S	99-5S	98-3S																											
08/05/02	08/06/02	08/08/02	08/08/02	08/08/02	08/05/02	08/05/02	08/05/02	08/08/02	08/08/02	08/08/02	08/08/02	08/08/02	08/08/02	08/06/02	08/06/02	08/06/02	08/08/02	08/08/02	08/08/02																										
Date	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT	FT																										
ELEVATION	835	950	840	840	835	830	840	1120	895	895	900	1178	1126	836	1133	899	903	1257	1135																										
DEPTH BELOW LAND SURFACE	15	UNK	--	--	--	--	--	--	--	--	--	116	51	15	116	56	49	178	52																										
STATIC WATER LEVEL	13.3	30.2	--	--	--	--	--	--	--	--	--	79.5	38.5	5	87.5	29	40.5	154	43.5																										
FLOW	--	--	12.3	12.4	0.00275	0.0084	7.6	0.48 gpm	1.4 gpm	8 gpm	18.5 gpm	--	--	--	--	--	--	--	--																										
pH, Field	7.1	7.5	8.1	8.0	8.3	8.0	7.9	7.6	7.6	7.1	8.1	8.7	6.3	6.8	8.4	7.0	8.6	8.3	6.6																										
TOTAL ACIDITY	25	11	3.9	4.1	7.2	11	4.3	9.1	42	56	6.9	ND	27	30	ND	40	*	10	*																										
TOTAL ALKALINITY	320	260	150	150	230	260	140	270	640	590	490	460	190	310	1100	520	360	1400	150																										
TOTAL IRON	0.23	5.0	0.68	1.5	0.10	ND	0.53	ND	0.45	4.3	0.57	0.52	2.1	ND	0.24	1.8	*	ND	*																										
TOTAL MANGANESE	ND	0.93	0.07	0.11	0.08	0.23	0.07	ND	3.5	5.2	0.07	ND	0.11	0.01	ND	0.60	*	ND	*																										
TOTAL TOTAL SUSPENDED SOLIDS	72	11	12	48	ND	ND	9.0	ND	ND	13	38	ND	ND	ND	ND	ND	*	ND	*																										
TOTAL HARDNESS	480	260	200	240	60	1000	180	220	880	440	300	ND	240	420	ND	1300	*	ND	*																										
TOTAL SULFATES	320	8500	600	730	500	1200	70	37	1800	1400	2400	81	76	140	7.3	2000	310	4.2	220																										
TOTAL SPECIFIC CONDUCTANCE	1800	610	1700	2,200	1800	4000	450	590	4,600	3,800	6,500	990	570	930	1800	11,000	1500	10,000	630																										
TOTAL TOTAL DISSOLVED SOLIDS	10	*	*	1400	*	*	270	*	3600	2900	4600	*	*	650	1200	3500	970	2300	460																										
TOTAL ARSENIC	0.001	*	*	0.001	*	*	0.001	*	0.001	0.002	0.001	*	*	ND	ND	ND	*	0.01	*																										
TOTAL CADMIUM	0.02	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	ND	0.09	*	ND	*																										
TOTAL CHROMIUM	0.05	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	ND	ND	*	ND	*																										
TOTAL LEAD	0.03	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	ND	ND	*	ND	*																										
TOTAL SELENIUM	0.020	*	*	ND	*	*	ND	*	ND	ND	ND	*	*	ND	ND	ND	*	ND	*																										
TOTAL COPPER	0.01	*	*	0.05	*	*	0.05	*	0.04	0.05	0.03	*	*	0.09	0.02	0.07	*	0.07	*																										
TOTAL ZINC	0.01	*	*	2.0	*	*	0.69	*	ND	0.38	0.96	*	*	ND	1.3	0.11	*	ND	*																										
TOTAL ALUMINUM	0.10	*	*	170	*	*	16	*	240	190	300	*	*	66	7.4	130	*	570	*																										
TOTAL CHLORIDE	0.50	*	*	340	*	*	15	*	800	730	1000	*	*	33	490	530	*	910	*																										
TOTAL SODIUM	0.01	*	*	0.785	*	*	0.125	*	0.480	0.579	1.04	*	*	0.091	8.28	0.017	*	1.54	*																										
TOTAL FLUORIDE	0.002	*	*	0.01	*	*	ND	*	ND	ND	0.02	*	*	ND	0.02	ND	*	ND	*																										
TOTAL SILVER	0.01	*	*	0.17	*	*	0.14	*	0.12	0.15	0.09	*	*	0.17	0.11	0.09	*	0.22	*																										
TOTAL BARIUM	0.50	*	*	0.004	*	*	0.03	*	0.008	0.01	0.01	*	*	0.005	0.01	0.005	*	0.005	*																										
TOTAL HEX. CHROMIUM	0.002	*	*	0.004	*	*	0.009	*	0.007	0.006	0.008	*	*	0.0016	0.0005	0.0019	*	0.0007	*																										
TOTAL MERCURY	0.0001	*	*	0.0047	*	*	0.0009	*	0.0007	0.0006	0.0008	*	*	0.0016	0.0005	0.0019	*	0.0007	*																										
MDL																																													

* ANALYSIS NOT REQUIRED
ND NOT DETECTED AT MDL: METHOD DETECTION LIMIT

PERMITTEE'S SIGNATURE: David L. Bartosh DATE: 10/15/2002


LABORATORY NAME: TRADET, INC.

ANALYST'S SIGNATURE: Andrew R. Wasko II DATE: 9/13/02
Andrew R. Wasko II, General Laboratory Manager

THE OHIO VALLEY COAL COMPANY
POWATAN NO. 6 MINE
PERMIT D-0360
QUARTERLY MONITORING REPORT
4TH QUARTER 2002

ANALYSIS NOT REQUIRED
NOT DETECTED AT MDL; METHOD DETECTION LIMIT

LABORATORY NAME: TRADET, INC.

ANALYST'S SIGNATURE:  Richard P. Whitt - Vice-President

TOVCC 19911

6. *Where the isolation distance between the uppermost aquifer system and the bottom of the disposal unit is less than five feet of insitu geologic material.*

Response: The isolation distance between the bottom of the proposed coarse coal refuse and uppermost aquifer was determined from excavating test pits in the valley floor. The isolation distance ranged from 5.4 to 10.5 feet in five of the six pits. The minimum distance was 3.1 feet in test pit TP-7. Test pit results are found in Appendix II of this report.

Where less than five-feet of isolation distance naturally occurs, earthen fill will be added to provide a minimum of five-feet of isolation to the uppermost aquifer.

7.3 Probable Hydrologic Consequences

The proposed facility has the potential to produce acid drainage as well as high concentrations of suspended and dissolved solids, and metals such as iron and manganese. The construction, operation, maintenance, water monitoring and reclamation proposed are designed to mitigate or eliminate these effects. Consequently, there are no significant adverse impacts on the surface water, groundwater regime or hydrologic balance either on or off the site.

7.3.1 Surface Water

7.3.1.1 Surface Water Quantity

The proposed operation is expected to reduce base flows and peak flows in the downstream section of Perkins Run, due to the retention characteristics of the proposed sediment and quality control ponds. Runoff from the project or disturbed areas, which presently contributes to stream flow will be directed to sediment ponds. However, Perkins Run, which has intermittent flow during summer months, has no downstream users. Perkins Run discharges into Captina Creek. Since the area drained by Perkins Run represents a small percentage of the Captina Creek drainage basin, there should not be any recognizable difference in quantity flow in Captina Creek. It is predicted that the proposed operation will not result in any significant adverse impacts on surface water quantity in the area.

7.3.1.2 Surface Water Quality

The proposed operation could have both short-term and long-term impacts on the surface water quality in the receiving stream, especially during the early stages of construction. For instance, sediment loads to the drainage system will be increased. These impacts will be mitigated through proper execution of construction, operations, maintenance, water monitoring and reclamation. The quantity of sediment reaching surface waters should be minimized by directing all runoff through the proposed sedimentation pond and other erosion control facilities.

Diversion ditches will be installed to direct runoff away from the coarse coal refuse area. Runoff entering the refuse pile and leachate, if any, collected by the underdrain system may be high in iron and low in pH. This drainage will be directed to the sediment pond for treatment, if necessary, flow to the polishing pond, checked for quality, if the water meets permit compliance standards it will then be released to the receiving stream.

Long-term impacts are mitigated through implementation of the reclamation plan. The refuse surface will be graded, capped with two-feet of clay, compacted to achieve a permeability of E-07 or less, covered with up to an additional two-feet of earthen material and seeded. This cap and cover system is designed to minimize or eliminate the formation of leachate. The surface will be graded to promote immediate drainage. Water will not pond or accumulate on the reclaimed surface. Further, the clay cap will minimize infiltration and prevent oxidation of the coal refuse.

7.3.2 Groundwater

7.3.2.1 Groundwater Quantity

The proposed operation may locally reduce the groundwater recharge capabilities due to the following factors. First, the Perkins Run valley is to be filled with coal refuse, which is largely composed of claystone that becomes relatively impervious when compacted. Second, upon completion, approximately 100 acres will be capped with two-feet of impervious clay. Third, underdrains will be installed to intercept the majority of seepage through the fill area.

There are no down-gradient groundwater users in the immediate area. Since the affected area is small, there should be no short-term or long-term adverse impacts on regional groundwater availability.

7.3.2.2 Groundwater Quality

Based on the refuse characteristics, there is the potential that the proposed operation could produce high iron, acidic drainage. The impact is mitigated or eliminated through proper construction, engineering, maintenance, water monitoring and final reclamation. The proposed facility incorporates the following preventative measures. First, a groundwater underdrain system will be installed to collect, and convey down-gradient all seepage beneath the structure. Second, an impervious clay liner will be installed to separate the groundwater underdrain system from the coal refuse. The liner will be three-feet thick minimum, and compacted to permeability of E-07 or less. Along the valley bottom, the liner will be graded to slope 1% eastward and down the valley at existing grades to allow for leachate collection. Third, a leachate collection drain will be installed along the liner's eastern edge to convey leachate, if any, to the toe of the structure where it will drain to a clay lined pond for possible treatment. Fourth, coal refuse will be compacted to reduce oxidation of the acid producing constituents, mainly pyritic sulphur, and seepage through the refuse material. Fifth, an impervious clay cap will be installed, as cited in Section 7.3.1.2, to prevent surface water from migrating into and through the refuse fill, thereby eliminating or reducing the chance for leachate generation.

Through proper construction of the control features cited above, the proposed facility is not expected to have significant short-term or long-term adverse affects on groundwater quality in the area.



Fountain Square • Columbus, Ohio • 43224 • (614) 466-4850

October 16, 1980

RE: Buffer Zone Variance
Mine No. 6, I.D. No. 33-01159

Your request for a buffer zone variance at Mine No. 6 for the areas within one hundred (100) feet of Captina Creek and Perkins Run is granted subject to the following performance standards:

- 1) The waterway(s) shall be separated from the disturbed area by a dike or diversion that will direct surface drainage through a treatment system prior to entering the waterway(s).
- 2) Areas between the waterway(s) and the dike or diversion must be protected from erosion and kept free of all acid or toxic-forming materials.

Charles E. Call
Charles E. Call, Chief
Division of Reclamation

cc: J. Sprouse
File

APR 6 1984
LARRY K. MARONE

THE NORTH AMERICAN COAL CORPORATION
CENTRAL DIVISION
ENVIRONMENTAL DEPARTMENT

CC - 20 1680

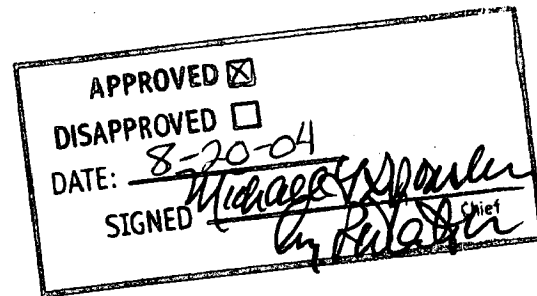
Powhatan Pt., Ohio



February 7, 2004

ADDENDUM TO PART 3, PAGE 27, ITEM G(5)
STREAM BUFFER ZONE VARIANCE REQUEST
THE OHIO VALLEY COAL COMPANY

Mr. Michael S. Sponsler, Chief
Division of Mineral Resource Management
1855 Fountain Square Court, Bldg. H-2
Columbus, Ohio 43224-1383



Dear Chief Sponsler,

The Ohio Valley Coal Company hereby requests a variance to conduct refuse disposal operations within the buffer zone of unnamed intermittent streams as shown on the permit application map and described below.

SPECIFIC ACTIVITIES:

Unnamed Stream "C"

Activities to be conducted within the 100 foot buffer zone of Stream "C" located within Permit D-0360 consists of raising the water elevation within the existing coal refuse disposal areas. All topsoil will be removed within this area of the buffer zone of this stream.

For purposes of this description, Stream "C" flows in a southwesterly direction. The stream channel will be disturbed and eliminated up to the 1130 elevation. One hundred one (101) feet of the Stream "C" channel will be affected by this activity.

Existing conditions in Stream "C" consists of a substrate of sand and bedrock of sandstone and shale origin. Silt cover is moderate with moderate embeddedness. In-stream cover is generally sparse and consists of shallows and boulders. Channel morphology exhibits low sinuosity, poor development, no channelization, and high stability. Riparian width is none, with a forested floodplain and no bank erosion. Pool/glide and riffle/run quality have a maximum depth of less than 0.2 meters. Pool width is more than riffle width with slow velocity. Riffle/run substrate is stable with low embeddedness.

OPERATOR

56854 PLEASANT RIDGE ROAD • ALLEDONIA OHIO 43902
(740) 926-1351 • FAX (740) 926-1615

Stream "C" has been previously affected downstream by coal refuse disposal.

The duration of activities within the buffer zone of Stream "C" will be approximately 2.5 years. Disturbance of this buffer zone will begin upon approval of the A.R.P. that this BZVR is associated with.

Unnamed Stream "E"

Activities to be conducted within the 100 foot buffer zone of Stream "E" located within Permit D-0360 consists of raising the water elevation within the existing coal refuse disposal area. All topsoil will be removed within this area of the buffer zone of this stream.

For purposes of this description, Stream "E" flows in a southwesterly direction from head of hollow. The stream channel will be disturbed and eliminated up to the 1130 elevation. One hundred seventeen (117) feet of the Stream "E" channel will be affected by this activity.

Existing conditions in Stream "E" consists of a substrate of sand and bedrock of sandstone and shale origin. Silt cover is moderate with moderate embeddedness. In-stream cover is generally sparse and consists of shallows and boulders. Channel morphology exhibits low sinuosity, poor development, no channelization, and high stability. Riparian width is none, with a forested flood plain and no bank erosion. Pool/glide and riffle/run quality have a maximum depth of less than 0.2 meters. Pool width is more than riffle width with slow velocity. Riffle/run substrate is stable with low embeddedness.

Stream "E" has been affected downstream by coal refuse disposal.

The duration of activities within the buffer zone of Stream "E" will be approximately 2.5 years. Disturbance of this buffer zone will begin upon approval of the A.R.P. that this BZVR is associated with.

Unnamed Stream "F"

Activities to be conducted within the 100 foot buffer zone of Stream "F" located within Permit D-0360 consists of raising the water elevation within the existing coal refuse disposal area. All topsoil will be removed within this area of the buffer zone of this stream.

For purposes of this description, Stream "F" flows in a southeasterly direction from head of hollow. The stream channel will be disturbed and eliminated up to the 1130 elevation. One hundred eighteen (118) feet of the Stream "F" channel will be affected by this activity.

Existing conditions in Stream "F" consists of a substrate of sand and bedrock of sandstone and

shale origin. Silt cover is moderate with moderate embeddedness. In-stream cover is generally sparse and consists of shallows and boulders. Channel morphology exhibits low sinuosity, poor development, no channelization, and high stability. Riparian width is none, with a flood plain of forested pasture and no bank erosion. Pool/glide and riffle/run quality have a maximum depth of less than 0.2 meters. Pool width is more than riffle width with slow velocity. Riffle/run substrate is stable with low embeddedness.

Stream "F" has been affected downstream by coal refuse disposal.

The duration of activities within the buffer zone of Stream "F" will be approximately 2.5 years. Disturbance of this buffer zone will begin upon approval of the A.R.P. that this BZVR is associated with.

Unnamed Stream "H"

Activities to be conducted within the 100-foot buffer zone of Stream "H" located within Permit D-0360 consists of raising the water elevation within the existing coal refuse disposal area. All topsoil will be removed within this area of the buffer zone of this stream.

For purposes of this description, Stream "H" flows in a southeasterly direction from head of hollow. The stream channel will be disturbed and eliminated up to the 1130 elevation. Two hundred nine (209) feet of the Stream "H" channel will be affected by this activity.

Existing conditions in Stream "H" consists of a substrate of sand and bedrock of sandstone and shale origin. Silt cover is moderate with moderate embeddedness. In-stream cover is generally sparse and consists of shallows and boulders. Channel morphology exhibits low sinuosity, poor development, no channelization, and high stability. Riparian width is none, with a flood plain of forested pasture and no bank erosion. Pool/glide and riffle/run quality have a maximum depth of less than 0.2 meters. Pool width is more than riffle width with slow velocity. Riffle/run substrate is stable with low embeddedness.

Stream "H" has been affected downstream by coal refuse disposal.

The duration of activities within the buffer zone of Stream "H" will be approximately 2.5 years. Disturbance of this buffer zone will begin upon approval of the A.R.P. that this BZVR is associated with.

Unnamed Stream "I"

Activities to be conducted within the 100-foot buffer zone of Stream "I" located within Permit D-0360 consist of raising the water elevation within the existing coal refuse disposal area. All topsoil will be removed within this area of the buffer zone of this stream.

For purposes of this description, Stream "I" flows in a southerly direction from head of hollow. The stream channel will be disturbed and eliminated up to the 1130 elevation. One hundred twenty nine (129) feet of the Stream "I" channel will be affected by this activity.

Existing conditions in Stream "I" consists of a substrate of sand and bedrock of sandstone and shale origin. Silt cover is moderate with moderate embeddedness. In-stream cover is generally sparse and consists of shallows and boulders. Channel morphology exhibits low sinuosity, poor development, no channelization, and high stability. Riparian width is none, with a flood plain of forested pasture and no bank erosion. Pool/glide and riffle/run quality have a maximum depth of less than 0.2 meters. Pool width is more than riffle width with slow velocity. Riffle/run substrate is stable with low embeddedness.

Stream "I" has been affected downstream by coal refuse disposal.

The duration of activities within the buffer zone of Stream "I" will be approximately 2.5 years. Disturbance of this buffer zone will begin upon approval of the A.R.P. that this BZVR is associated with.

Unnamed Stream "J"

Activities to be conducted within the 100 foot buffer zone of Stream "J" located within Permit D-0360 consists of raising the water elevation within the existing coal refuse disposal area. All topsoil will be removed within this area of the buffer zone of this stream.

For purposes of this description, Stream "J" flows in a southeasterly direction from head of hollow. The stream channel will be disturbed and eliminated up to the 1130 elevation. Sixty-four (64) feet of the Stream "J" channel will be affected by this activity.

Existing conditions in Stream "J" consists of a substrate of sand and bedrock of sandstone and shale origin. Silt cover is moderate with moderate embeddedness. In-stream cover is generally sparse and consists of shallows and boulders. Channel morphology exhibits low sinuosity, poor development, no channelization, and high stability. Riparian width is none, with a flood plain of forested pasture and no bank erosion. Pool/glide and riffle/run quality have a maximum depth of less than 0.2 meters. Pool width is more than riffle width with slow velocity. Riffle/run substrate is stable with low embeddedness.

Stream "J" has been affected downstream by coal refuse disposal.

The duration of activities within the buffer zone of Stream "J" will be approximately 2.5 years. Disturbance of this buffer zone will begin upon approval of the A.R.P. that this BZVR is associated with.

Identification of Ephemeral Stream Channels

There are six (6) ephemeral stream channels that will be affected by the proposed raising of the water level at the #2 Dam site. Each one has been considered in the June 30, 2003 letter from the Army Corp of Engineers. These ephemeral channels have been identified on the map and are described as follows:

Ephemeral channel E1 is located south of Unnamed Stream "H". An additional 41 feet of this channel will be affected by raising the water level at this site.

Ephemeral channel E2 is located south of Unnamed Stream "H". An additional 44 feet of this channel will be affected by raising the water level at this site.

Ephemeral channel E3 is located south of Unnamed Stream "F". An additional 55 feet of this channel will be affected by raising the water level at this site.

Ephemeral channel E4 is located in the first hollow southeast of Unnamed Stream "J". An additional 113 feet of this channel will be affected by raising the water level at this site.

Ephemeral channel E5 is located in the second hollow southeast of Unnamed Stream "J". An additional 68 feet of this channel will be affected by raising the water level at this site.

Ephemeral channel E6 is located in the third hollow southeast of Unnamed Stream "J". An additional 106 feet of this channel will be affected by raising the water level at this site.

All of these ephemeral channels are small hollow depressions that create flow only during periods of sustained rainfall. These ephemeral channels are being addressed in this B.Z.V.R. to clarify their respective lengths and location per the Army Corp of Engineers correspondence dated June 30, 2003 letter, and their required permitting under the Nationwide 21 permit. Streams in, and buffer zones of, the ephemeral channels are not required to be, and therefore are not being shown on the A.R.P. Application map.

NECESSITY FOR ACTIVITIES:

The existing #2 Dam refuse disposal area is nearly filled to currently approved capacity. Additional slurry refuse disposal area is necessary while permitting of a new area for this purpose is completed and approved by the appropriate regulatory agencies.

Other disposal sites were considered on areas owned by The Ohio Valley Coal Company remote from the existing disposal area. These sites were eliminated from consideration for several reasons. They would require haulage of refuse along township or county roads. This would create the potential for pollution of streams away from the permit as well as refuse dropping from the haulage vehicles onto the public roads. The construction of the disposal area would require an entirely new and separate system of pollution controls whereas the main pollution controls for the proposed site are in existence already.

WATER QUALITY/QUANTITY AND ENVIRONMENTAL RESOURCES:

Water quality in Unnamed Streams "C", "E", and "F" is generally fair. Acceptable levels of manganese, sulfates and iron are indicated by the six monthly samples at these locations. In six months sampling, average flows in stream "C" (U6-17) range from 0.02 cfs to 0.002 cfs. Average flows in stream "E" (U6-15) range from 0.09 cfs to 0.008 cfs. Average flows in stream "F" (U6-7) range from 0.03 cfs to 0.0003 cfs. (See approved permit D-0360-8 for sample analyses)

Water quality in Unnamed Streams "H", "I", and "J" is generally fair. Acceptable levels of all parameters are indicated by the six monthly samples at these locations, with the exception of Stream "J" (U6-8) which shows elevated pH and iron levels during the March and April sampling analyses. In six months sampling, average flows in Stream "H" (U6-13A) range from .002 cfs to .1 cfs. Average flows in Stream "I" (U6-14) range from .003 cfs to .09 cfs. Average flows in Stream "J" (U6-8) range from .0006 cfs to .02 cfs. (See approved permit D-0360-8 for sample analyses)

Riparian vegetation within the stream channels consist of typical plant life, while the buffer zones are forested or forested pasture with shrubs, small trees and hardwoods.

There are numerous wooded areas and streams surrounding the site on land, which is owned by The Ohio Valley Coal Company, which will provide wildlife habitat and travel corridors until the site is reclaimed

All topsoil will be stripped from the proposed affected areas.

An Ohio E.P.A. 401 certification is not required at this site, per O.E.P.A. letter dated May 30, 2003. A Nationwide 21 permit has been submitted to the Army Corp of Engineers.

SEQUENCING OF OPERATIONS

The total life of this coal slurry refuse disposal facility extension is projected to be approximately

2.5 years. The sequence of proposed activities is as follows:

- 1) Topsoil removal and stock piling
- 2) Refuse placement

STREAM RECONSTRUCTION, DIVERSION OR RELOCATION:

No stream reconstructions or relocations are applicable for this project. All stream and buffer zone effects as well as sequencing of operations are discussed in the previous sections of this document.

REVEGETATION:

Revegetation in the buffer zone areas described herein is not applicable due to the circumstances of the proposed A.R.P.

All work within the stream buffer zone will be performed in timely and workmanlike manner to prohibit as best as can be accomplished, detrimental affects upstream.

Sincerely,
THE OHIO VALLEY COAL COMPANY

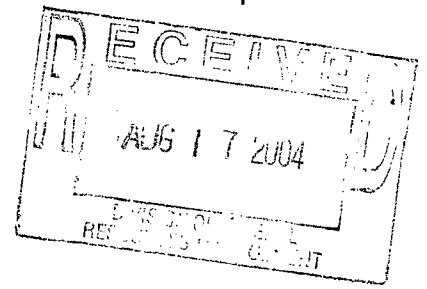
A handwritten signature in black ink, appearing to read "David L. Bartsch". The signature is fluid and cursive, with a large initial "D" and "B".

David L. Bartsch, P.E.
Environmental Coordinator and
Permit Administrator

cc: File



DEPARTMENT OF THE ARMY
PITTSBURGH DISTRICT, CORPS OF ENGINEERS
WILLIAM S. MOORHEAD FEDERAL BUILDING
1000 LIBERTY AVENUE
PITTSBURGH, PA 15222-4186



REPLY TO
ATTENTION OF:

August 13, 2004

Operations and Readiness Division
Regulatory Branch
200300853

Mr. Dave Bartsch
The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Dear Mr. Bartsch:

I refer to your Department of the Army Permit Application, received in this office July 12, 2004, regarding your proposal to raise the level of the existing No. 2 Slurry Impoundment located in Belmont County, Ohio.

The project includes elevation of the spillway and slurry decant pipe being raised by ten feet. The impoundment is currently permitted at 1,120 feet and the elevation to which it is proposed to be raised is 1,130 feet above sea level. Five intermittent and three ephemeral stream channels totaling approximately 865 linear feet will be impacted as a result of the elevation change. Mitigation will involve 865 linear feet of Millers Run. The mitigated stream will be dedicated in perpetuity through a deed restriction by the American Energy Corporation.

Activities associated with projects of this type are authorized by Nationwide Permit No. 21 (see enclosure), previously issued by the Corps of Engineers, for purposes of Section 404 of the Clean Water Act as published in the January 15, 2002 issue of the Federal Register.

Enclosed is a list of conditions which must be followed for the Nationwide Permit to be valid. Adherence to these conditions will permit you to proceed with the proposed project. Please add the following conditions:

1. The American Energy Corporation must provide a Notarized letter to the Corps of Engineers, Pittsburgh District certifying the information described in your mitigation plan within 60 days of the completion date for the proposed expansion project.
2. As-Built drawings must be provided to this office after the stream mitigation documentation is filed.

Please Note, the attached Compliance Certification Form must be signed and returned to this office upon completion of the proposed work.

The verification of this Nationwide Permit is valid until August 13, 2006 unless the Nationwide Permit is modified, suspended, or revoked. If project specifications are changed or work has not been initiated before August 13, 2006, please contact this office for further approval.

The issuance of this Nationwide Permit will not relieve you of the responsibility to obtain any other required state, local, or Federal authorizations.

If you have any questions, please contact Allen Edris at (412) 395-7158.

Sincerely,

SIGNED

Scott A. Hans
Acting Chief,
Regulatory Branch

Enclosure

CF:

Ohio EPA (Randy Bournique)
ODNR (Tereva Knasel) ✓
ODNR (Kevin Ricks)

Compliance Certification Form

PERMIT NUMBER: 200300853

NAME OF PERMITTEE: The Ohio Valley Coal Company

DATE OF ISSUANCE: August 13, 2004

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Pittsburgh District
Regulatory Branch, Room 1834
William S. Moorhead Federal Building
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

Please note that your permitted activity is subject to compliance inspection by a U.S. Army Corps of Engineers Representative. If you fail to comply with this permit, you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

Signature of Permittee



DEPARTMENT OF THE ARMY
PITTSBURGH DISTRICT, CORPS OF ENGINEERS
WILLIAM S. MOORHEAD FEDERAL BUILDING
1000 LIBERTY AVENUE
PITTSBURGH, PA 15222-4186

June 30, 2003

REPLY TO
Operations and Readiness Division
Regulatory Branch
200300853

Mr. Dave Bartsch
The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Dear Mr. Bartsch:

Reference is made to your request for a jurisdictional determination on the proposed enlargement of the No. 2 Slurry impoundment of the Powhatan No. 6 Mine (ref. D-0360), on unnamed tributaries to Perkins Run, within Washington Township, Belmont County, Ohio. Raising the impoundment 10 feet to an elevation of 1130, would impact 1,156 linear feet of 11 small tributaries.

Fills or earth disturbances within these streams would require authorization from this office under Section 404 of the Clean Water Act.

Based on the preliminary project description and location within the watershed, it appears this project may be eligible for authorization under a Nationwide Permit No. 21. Please note that the notification conditions of this Nationwide Permit must be met and should include an Office of Surface Mining or state approved mitigation plan. Such stream mitigation may be in the form of stream restoration, enhancement, or preservation measures. Enclosed is a copy of a Public Notice outlining the Nationwide Permits and their requirements.

In planning future development every effort should be made to avoid and minimize wetland impacts to the fullest extent practicable. If encroachments are planned within the wetland areas they should be accurately delineated and this office again contacted to determine permit requirements. Development of the upland areas would not require authorization from this office.

We will continue to work with you in your development plans in order to protect the aquatic resources. If you have any questions, please contact Scott A. Hans at (412) 395-7154.

Sincerely,



Albert H. Rogala
Chief, Regulatory Branch

Enclosure

Copies Furnished:

ODNR, Division of Mineral Resources Management
3601 Newgarden Road
Salem, OH 44460

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: <i>Ohio Valley Coal</i>	File Number: <i>260300853</i>	Date: <i>6-30-03</i>
Attached is:		See Section Below
INITIAL PROFFERED PERMIT (Standard Permit or Letter of Permission)		A
PROFFERED PERMIT (Standard Permit or Letter of Permission)		B
PERMIT DENIAL		C
✓ APPROVED JURISDICTIONAL DETERMINATION		D
PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I: The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at: <http://www.usace.army.mil/inet/functions/cw/cecwo/rcg/appeals.htm> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

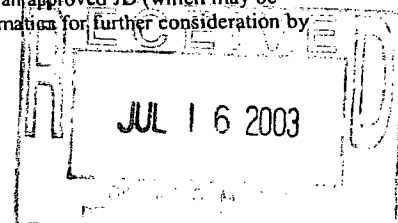
C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

OPERATOR



TOVCC 19928



State of Ohio Environmental Protection Agency

STREET ADDRESS:

Lazarus Government Center
122 S. Front Street
Columbus, Ohio 43215

TELE: (614) 644-3020 FAX: (614) 644-3164

MAILING ADDRESS:

P.O. Box 1049
Columbus, OH 43216-1049

June 18, 2004

Ohio Valley Coal Company
Attn: David Bartsch
56854 Pleasant Ridge Road
Alledonia, OH 43902

RE: BELMONT COUNTY
OHIO VALLEY COAL CO.
PERKINS RUN SLURRY
IMPOUNDMENT
CORRESPONDENCE (IWW)

Dear Mr. Bartsch:

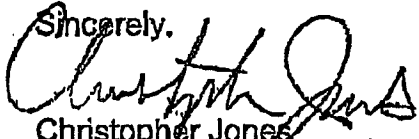
I hereby approve the changes to the detailed plans approved by Permit to Install (PTI) No.06- 5467, dated May 18, 2000, for the Ohio Valley Coal Co. Perkins Run Slurry Impoundment, located in Belmont County, Ohio. The changes include:

- Raising the slurry impoundment dam from a maximum elevation of 1130 ft. to 1140 ft.;
- Raising the actual liquid level from an elevation of 1120 ft. to 1130 ft.; and
- Extending the decant pipe, the cutoff trenches and the invert of the emergency spillway 10 ft. vertically.

There shall be no additional changes or deviation from the Plans that were approved under PTI #06-5467 without prior written expressed approval by the Agency. All conditions of PTI #06-5467 are unchanged and must be complied with.

This approval is considered to be a final action of the director. Any person who was a party to this proceeding may appeal this action to the Environmental Review Appeals Commission pursuant to Ohio Revised Code 3745.04. To appeal this action, a written notice of appeal, setting forth the action complained of and the grounds for appeal, must be filed with the Environmental Review Appeals Commission at 309 South 4th Street, #222 Columbus, Ohio 43215, within thirty (30) days after the date of this letter. You must also serve a copy of the notice of appeal to the director of Ohio EPA and the Environmental Enforcement Section of the Office of the Attorney General within three (3) days of filing a notice of appeal with the Environmental Review Appeals Commission.

Sincerely,



Christopher Jones
Director

cc: Mike Dillman, ODNR Division of Mineral Resource Management (1855 Fountain Square Court Building H-3, Columbus, OH 43224-1383)

Enclosure (approved plans)

Bob Taft, Governor
Jennette Bradley, Lieutenant Governor
Christopher Jones, Director



State of Ohio Environmental Protection Agency

STREET ADDRESS:

Lazarus Government Center
122 S. Front Street
Columbus, OH 43215-1099

TELE: (614) 644-3020 FAX: (614) 644-2329

MAILING ADDRESS:

P.O. Box 1049
Columbus, OH 43216-1049

May 30, 2003

Dave Bartsch
Ohio Valley Coal Company
56954 Pleasant Ridge Road
Alledonia, Ohio 43902

Re: Number 2 Slurry Impoundment

Dear Mr. Bartsch:

I have reviewed the information that you sent to me on May 15, 2003, regarding the above referenced slurry impoundment and Ohio Valley Coal Company's plan to raise the slurry impoundment embankment by ten feet.

Based on my review of the information sent and our previous discussion, the modification of the slurry impoundment embankment should not require an individual 401 Water Quality Certification.

You indicated that the Corps of Engineers will approve this project using Nationwide Permit 21. The Ohio EPA certified the Nationwide Permits (NWP), including NWP 21, on May 22, 2002. The conditions in that certification will apply under these circumstances.

Should you have any questions about the information I've presented, please call me at (614) 644-2013.

Sincerely,

Randy Bourmique,
Manager
401/Wetlands Section

Bob Taft, Governor
Maureen O'Connor, Lieutenant Governor
Christopher Jones, Director

U.S. Department of Labor

Mine Safety and Health Administration
604 Cheat Road
Morgantown, West Virginia 26508



JUN 18 2004

Mr. Jerry M. Taylor
Corporate Safety Director
The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Dear Mr. Taylor:

The final review of all information concerning the proposed 10-foot raise of embankment crest, invert of the decant pipe inlet, and the invert of the open channel emergency spillway for the No. 2 Slurry Impoundment, MSHA I.D. No. 1211-OH03-00025-03, located at the Powhatan No. 6 Mine, I.D. No. 33-01159, has been completed. The technical issues relative to the original design plan for the 10-foot raise dated May 22, 2003, have been addressed and the modification is hereby approved.

A copy of memorandums dated May 24, 2004, and June 10, 2004, from the Mine Waste and Geotechnical Engineering Division of the Mine Safety and Health Administration are attached to this letter for your information. All recommendations in these memorandums are included in your approved plan.

If you have any questions, please feel free to contact this office.

Sincerely,

A handwritten signature in black ink, appearing to read "Kevin G. Stricklin".

Kevin G. Stricklin
District Manager

Enclosure

cc: Dave Bartsch, The Ohio Valley Coal Company
Mia Kannik, ODNr



May 13, 2003

Mr. William P. Knepp
Acting District Manager
Mine Safety and Health Administration
5012 Mountaineer Mall
Morgantown WV 26505

Attn: Mr. Pat Betoney

Re: No. 2 Slurry Impoundment (I.D. No. 1211-OH8-0025-03)

Gentlemen:

The Ohio Valley Coal Company presents, for your approval, the enclosed plans to raise the No. 2 Slurry Impoundment 10 ft. Currently, the embankment is at elevation 1125 ft with an ultimate crest elevation of 1130 ft, normal pool at 1120 ft. The proposal is to raise the embankment to an ultimate crest elevation of 1140 ft with normal pool at 1130 ft. The plans show the changes to the crest, the decant system, and the emergency spillway required for this change. We currently are raising the embankment the additional 5 ft to the current target crest and would like to continue to raise the embankment to the new target crest, this year if possible. Please contact Mr. Pete Nix of DLZ Ohio, Inc. or me if you have any questions.

Sincerely,

THE OHIO VALLEY COAL COMPANY

David L. Bartsch, P.E.
Environmental Coordinator and
Permit Administrator

cc: Mr. Nix
File

**ODNR
DIVISION OF WATER
WATER MANAGEMENT SECTION SUBMITTAL**



May 13, 2003

Mr. Dick Bartz
Chief
Ohio Division of Water
Ohio Department of Natural Resources
1939 Fountain Square Court Building E-3
Columbus OH 43224-1336

Attn: Mr. Tom Lagucki

Re: No. 2 Slurry Impoundment (Permit 075-87)

Gentlemen:

The Ohio Valley Coal Company presents, for your approval, the enclosed plans to raise the No. 2 Slurry Impoundment 10 ft. Currently, the embankment is at elevation 1125 ft with an ultimate crest elevation of 1130 ft, normal pool at 1120 ft. The proposal is to raise the embankment to an ultimate crest elevation of 1140 ft with normal pool at 1130 ft. The plans show the changes to the crest, the decant system, and the emergency spillway required for this change. We currently are raising the embankment the additional 5 ft to the current target crest and would like to continue to raise the embankment to the new target crest, this year if possible. Please contact Mr. Pete Nix of DLZ Ohio, Inc. or me if you have any questions.

Sincerely,
THE OHIO VALLEY COAL COMPANY

David L. Bartsch, P.E.
Environmental Coordinator and
Permit Administrator

cc: Mr. Nix
File



May 22, 2003

The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Attn: Mr. David Bartsch, P.E.

Re: Design Drawings and Recommendations
Embankment Raising
Slurry Dam No. 2

Mr. Bartsch:

It is understood that Ohio Valley Coal Company would like to increase their available slurry storage behind the No. 2 dam by raising the crest of the embankment to elevation 1140 (current design crest elevation is 1130). Enclosed are design calculations, recommendations, and drawings to raise the embankment and pool elevations at the project. Discussions of the various design features related to raising the embankment at the project are discussed below. The plans of the proposed improvements to raise the project are presented in Appendix I.

Presently, the plan for the No. 2 Dam consists of an embankment with a crest elevation of 1130, a maximum normal pool at elevation 1120, and the emergency spillway crest at elevation 1122.5. Based on our review of the hydrologic and hydraulic design data for No. 2 dam, raising the embankment to elevation 1140 would increase the available storage at the project by approximately 1,600 acre-feet. This assumes an ultimate normal pool elevation of 1130, a spillway crest elevation of 1132.5, and a maximum pool extending to elevation 1137 during the design storm.

The proposed improvement plans in Appendix I present cross-sections of the original ultimate embankment and the proposed ultimate embankment. The existing cutoff trenches on both abutments will be extended to elevation 1140 before the new embankment is constructed.

The Perkins Run Disposal facility is immediately downstream of the embankment. The refuse in this facility is currently at approximately elevation 1125 and eventually will be raised to elevation 1140 or above. Due to the past seepage concerns at the project, it is recommended that the elevation of the disposal fill be kept at or above the pool level throughout the construction and operation of the project.

Construction of the dam embankment extension will require placing well-compacted fill over a portion of the Perkins Run Disposal fill. The Perkins Run Disposal fill may consolidate during the construction of the dam embankment extension resulting in settlement of the new ultimate embankment crest. This condition should be monitored following the completion of the dam embankment extension. If settlement has occurred, then additional fill should be added to reach the ultimate embankment crest elevation and the crest monitored for additional settlement.

6121 Huntley Road • Columbus, Ohio 43229-1003 • (614) 888-0040 • FAX (614) 848-6712
With Offices Throughout The Midwest
www.dlz.com

TOVCC 19935



ENGINEERS • ARCHITECTS • SCIENTISTS
PLANNERS • SURVEYORS

Mr. David Bartsch

May 22, 2003

Page 2

Drawings have also been prepared for the new decant structure extension (see Appendix I). The decant structure will have to be extended up the right upstream abutment to allow flows for pools above elevation 1127. Based on the subsurface conditions in the area, the new decant extension will be founded on rock. In addition, we checked the structural capacity of the decant structure and the stoplogs for the additional overburden loads and determined that they are adequate.

Drawings have also been prepared for a new concrete wall to raise the control sill on the emergency spillway from elevation 1122.5 to elevation 1132.5. These drawings are presented in Appendix I and the wall design calculations are presented in Appendix II. A geologic cross-section of the spillway from the original No. 2 Dam Design Report is presented in Appendix III.

The wall was designed to withstand the loads of both refuse and water against it. The new wall will be an inverted T-wall, founded on hard, fractured, sandstone. The new wall will be located immediately upstream of the existing control sill. The wall was designed in accordance with the requirements of the Corps of Engineers Engineering Manual 1110-2-2502, Retaining and Flood Walls. A key will be provided beneath the wall foundation to reduce underseepage, and cutoffs will be excavated into the sides of the spillway slopes. Waterstops will be provided at all joints.

Because of the fractured condition of the foundation sandstone, there are concerns that water and slurry could seep beneath the wall. Consequently, it is recommended that an embankment of coarse refuse be placed on the upstream side of the wall to reduce the potential for seepage beneath the wall. The top of this blanket should be constructed to elevation 1130 and extend at least 60 feet (roughly 4 times the head) upstream of the new wall. However, we would also note that any seepage around or beneath the wall would flow down and spillway channel and into the existing Perkins Run Disposal Area sedimentation pond for treatment.

In addition, the wall will essentially act as a plunge pool structure during a spillway discharge. Calculations were performed to determine how far the water would splash as it flowed over the top of the wall. These calculations indicate that the splash zone would not extend beyond the limits of the new control sill foundation and the existing control sill. Cavitation against the downstream face of the wall was also checked and found not to be a problem. These evaluations are also presented in Appendix II.



ENGINEERS • ARCHITECTS • SCIENTISTS
PLANNERS • SURVEYORS

Mr. David Bartsch

May 22, 2003

Page 3

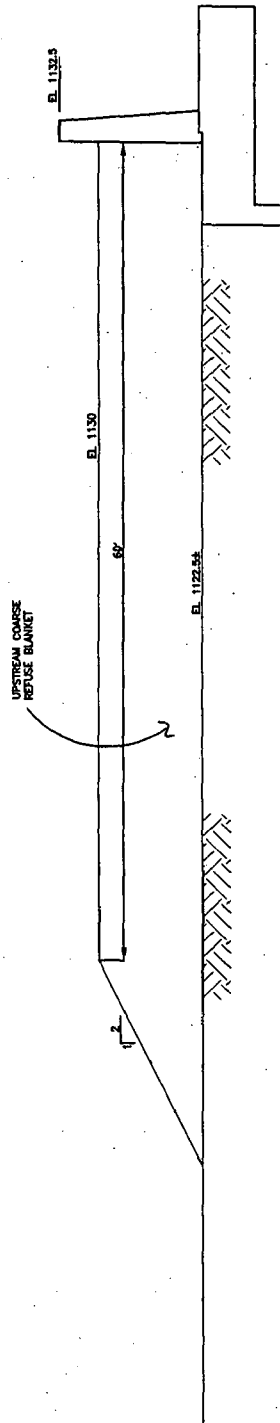
We hope that this information is helpful. Please call if you have any questions.

Sincerely,

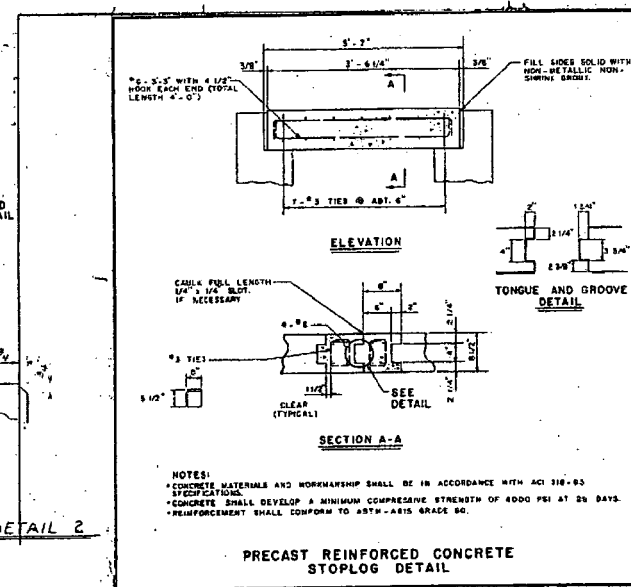
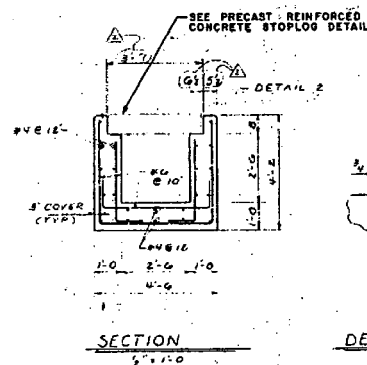
DLZ Ohio, Inc.

Arthur (Pete) Nix, P.E.

M:\proj\0321\3002.00\No 2 dam raising submittal ltr.doc



DLZ 6131 Hunter Road • Columbus, Ohio 43229-1003 Phone (614) 291-8700 • Fax (614) 291-8711 www.dlzc.com	OSHO VALLEY COAL CO.	EMBANKMENT RAISING NO. 2 SLURRY DAM	DESIGNED BY: H.S. DRAWN BY: H.S. CHECKED BY: ADN APPROVED BY: ADN	JOB NUMBER: 021-2002.00 SCALE: 1" = 10' DATE: MAY 21, 2003 REVISED:	UPSTREAM BLANKET PROPOSED CONTROL BILL	



DLZ Ohio, Inc.
6121 Huntley Road • Columbus, Ohio 43229-1003
Phone (614)288-0040 • Fax (614)288-6712
www.dlznorp.com

OHIO VALLEY COAL CO.

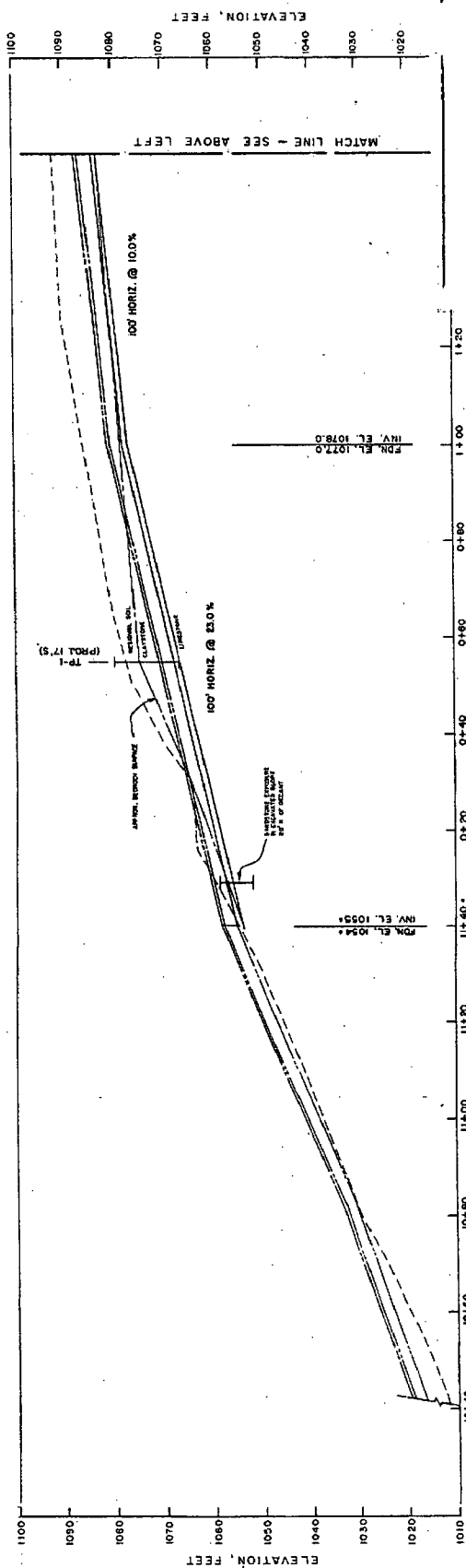
EMBANKMENT RAISING
NO. 2 SLURRY DAM

DESIGNED BY: JLS
CHECKED BY: JLS
APPROVED BY: JLS

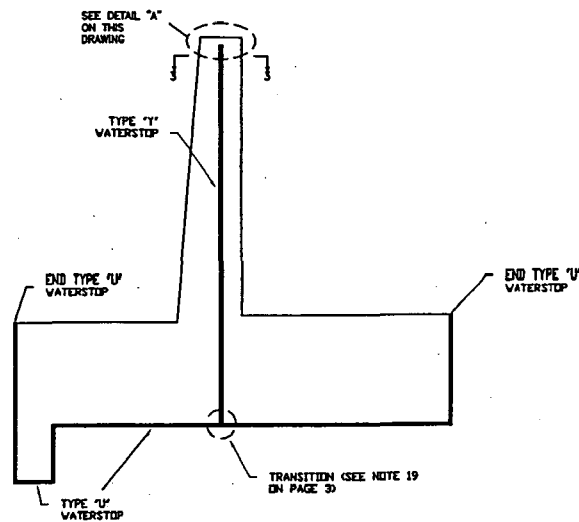
JOB NUMBER: 0001-000100
DATE: MAY 21, 2003
REVISED:

PROPOSED DECANT EXTENSION
DETAILS

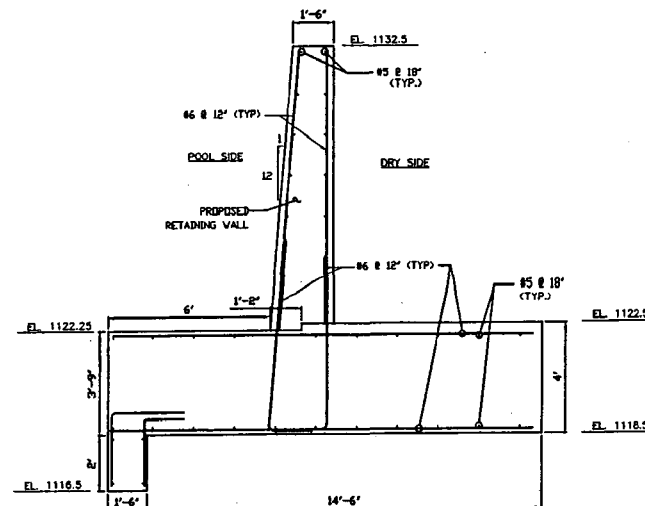
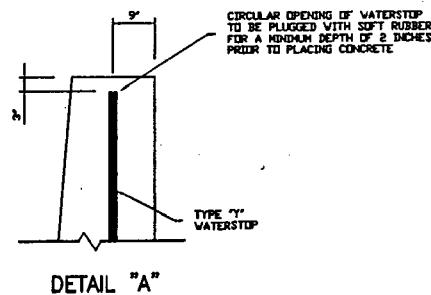




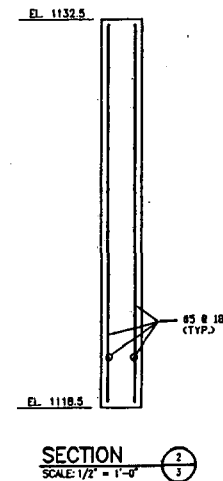
DLZ
Furniture • Appliances • Electronics



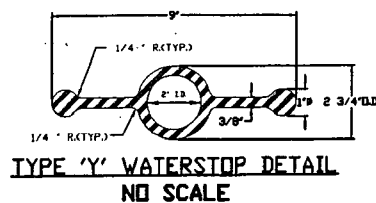
TYPICAL SECTION THROUGH EXPANSION JOINT AND CONTRACTION JOINT
(REINFORCING STEEL NOT SHOWN FOR CLARITY)
SCALE: 1/2" = 1'-0"



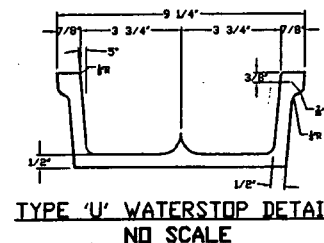
SECTION 1
SCALE: 1/2" = 1'-0"



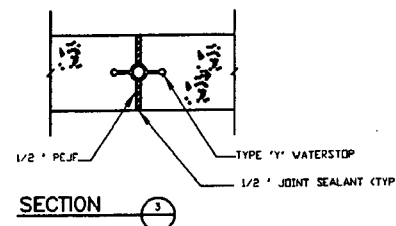
SECTION 2
SCALE: 1/2" = 1'-0"



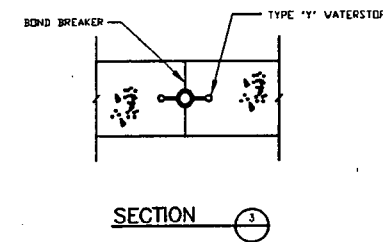
TYPE "Y" WATERSTOP DETAIL
NO SCALE



TYPE "U" WATERSTOP DETAIL
NO SCALE



SECTION 3
TYPICAL EXPANSION JOINT
NO SCALE



SECTION 4
TYPICAL CONTRACTION JOINT
NO SCALE



DLZ Ohio, Inc.
6121 Huntley Road • Columbus, Ohio 43229-1003
Phone (614) 858-0040 • Fax (614) 848-6712
www.dlzcorp.com

OHIO VALLEY COAL CO.

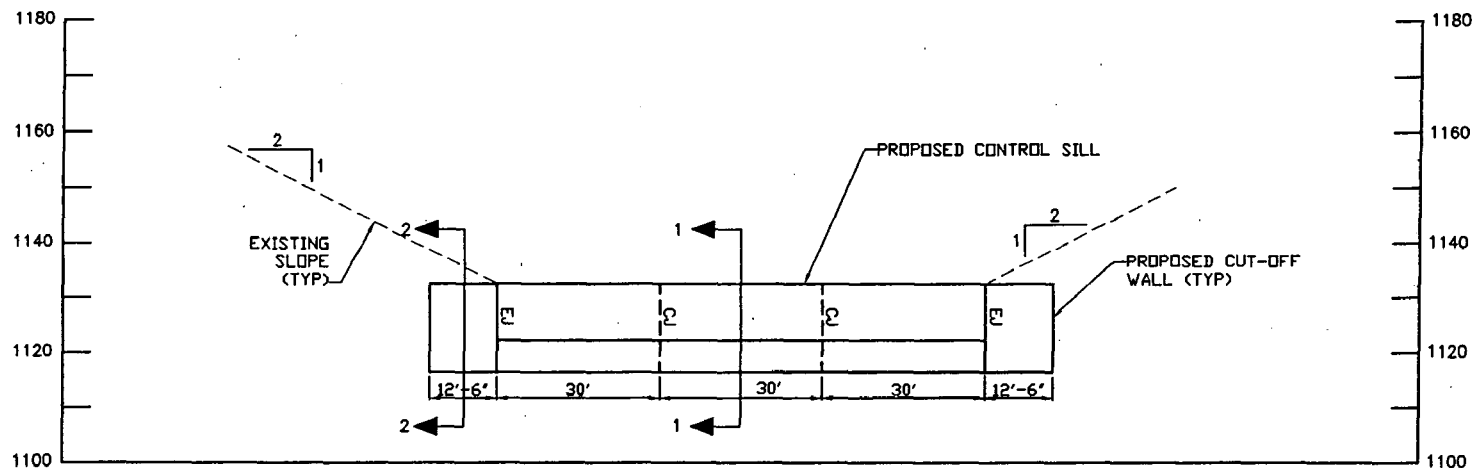
EMBANKMENT RAISING
NO. 8 SLURRY DAM

DESIGNED BY: TDM
DRAWN BY: RLS
CHECKED BY:
APPROVED BY: AEM

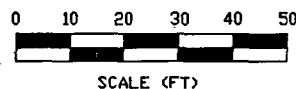
JOB NUMBER: 0301-3002.00
SCALE:
DATE: MAY 21, 2003
REVISION:

CROSS SECTIONS
PROPOSED SPILLWAY CONTROL
SILL





ELEVATION



GENERAL NOTES:

- 1) ALL CONCRETE AND CONCRETE WORK SHALL CONFORM TO THE LATEST EDITION OF ACI 318.
- 2) ALL CONCRETE WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH COLD WEATHER CONCRETE GUIDELINES (WHEN APPROPRIATE) AS OUTLINED IN ACI 308R.
- 3) ALL FORMWORK SHALL BE IN ACCORDANCE WITH ODOT ITEM 508 AND THE PLANS.
- 4) NO CONCRETE SHALL BE POURED IN AN EXCAVATION CONTAINING WATER OR FROZEN SUBGRADE.
- 5) ALL CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSED STRENGTH OF 4000 PSI AND SHALL MEET ALL REQUIREMENTS OF CLASS C CONCRETE DETAILED IN ODOT SUPPLEMENTAL SPECIFICATIONS 899 AND 842. ALL ADMIXTURES USED IN THE CONCRETE SHALL BE STATED ON THE CONCRETE DELIVERY TICKETS.
- 6) ALL CONCRETE SHALL HAVE 6+/-2 PERCENT ENTRAINED AIR. CHLORIDES SHALL NOT BE USED IN CONCRETE.
- 7) FIELD AND LABORATORY TESTING AND SAMPLING FOR CONCRETE SHALL BE PERFORMED BY THE CONTRACTOR AS DIRECTED BY OVC.
- 8) A MINIMUM CONCRETE COVER OF 3 INCHES SHALL BE PROVIDED FOR PROTECTION OF REINFORCING STEEL UNLESS SPECIFIED OTHERWISE ON THE PLANS.
- 9) ALL REINFORCING STEEL SHALL BE GRADE 60 AND CONFORM TO ASTM A615. ALL REINFORCING STEEL SHALL BE PLACED IN ACCORDANCE WITH ODOT ITEM 509.
- 10) REINFORCING STEEL SHOWN ON THE DETAILS SHALL BE ADJUSTED ACCORDINGLY INCLUDING CUTTING AND/OR BENDING TO FACILITATE THE PLACEMENT OR PASSAGE OF WATERSTOPS AND/OR ANY OTHER REQUIRED PENETRATION OR EMBEDMENT.
- 11) EXPOSED EDGES, JOINTS, EXTERNAL CORNERS AND VERTICAL EXPANSION AND CONTRACTION JOINTS OF CONCRETE SURFACES SHALL BE CHAMFERED 1 INCH UNLESS OTHERWISE SHOWN.
- 12) TEMPORARY EROSION CONTROL MEASURES SHALL CONSIST OF STRUCTURAL CONTROLS SUCH AS SEDIMENT BASINS, SEDIMENT TRAPS, SILT FENCE, STORM DRAIN INLET PROTECTION, STRAW BALE DIKES, AND DIVERSIONS AND/OR NONSTRUCTURAL CONTROLS SUCH AS SEEDING, MULCHING, AND FILTER STRIPS.
- 13) THE CONTRACTOR SHALL SUBMIT AN EROSION AND SEDIMENT CONTROL PLAN TO THE ENGINEER AT LEAST 30 DAYS BEFORE CONSTRUCTION BEGINS.
- 14) THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY COFFERDAMS AND DEWATERING DURING CONSTRUCTION.
- 15) JOINTS ARE SHOWN ON THE PLAN USING THE FOLLOWING IDENTIFIERS: "CJ" FOR CONTRACTION JOINTS, "EJ" FOR EXPANSION JOINTS. SEE DRAWINGS 3 AND 4 FOR ADDITIONAL "CJ" AND "EJ" INFORMATION.
- 16) ALL DIMENSIONS AND ELEVATIONS FOR THE EXISTING STRUCTURES WERE OBTAINED FROM THE ORIGINAL DESIGN DRAWINGS AND DO NOT NECESSARILY REPRESENT ACTUAL FIELD CONDITIONS. CONTRACTOR TO VERIFY ALL DIMENSIONS CRITICAL TO THE WORK.
- 17) REINFORCEMENT LAP SPLICES, BAR BENDS, HOOKS AND EMBEDMENT LENGTHS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318.
- 18) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF EXCAVATION SUPPORTS.
- 19) THE TYPE "Y" AND TYPE "U" WATERSTOPS SHALL BE JOINED BY VULCANIZING IF RUBBER WATERSTOPS ARE USED; OR BY HEAT SEALING THE JOINT IF PVC WATERSTOPS ARE USED.
- 20) EXTREME CARE SHALL BE EXERCISED IN PLACING TYPE "U" WATERSTOPS IN ORDER TO ENSURE FIRM CONTACT WITH THE PREPARED SUBGRADE THROUGHOUT ITS ENTIRE CONTACT AREA.



DLZ Ohio, Inc.
6121 Huntley Road • Columbus, Ohio 43229-1003
Phone (614) 888-0040 • Fax (614) 848-4712
www.dlzc.com

OHIO VALLEY COAL CO.

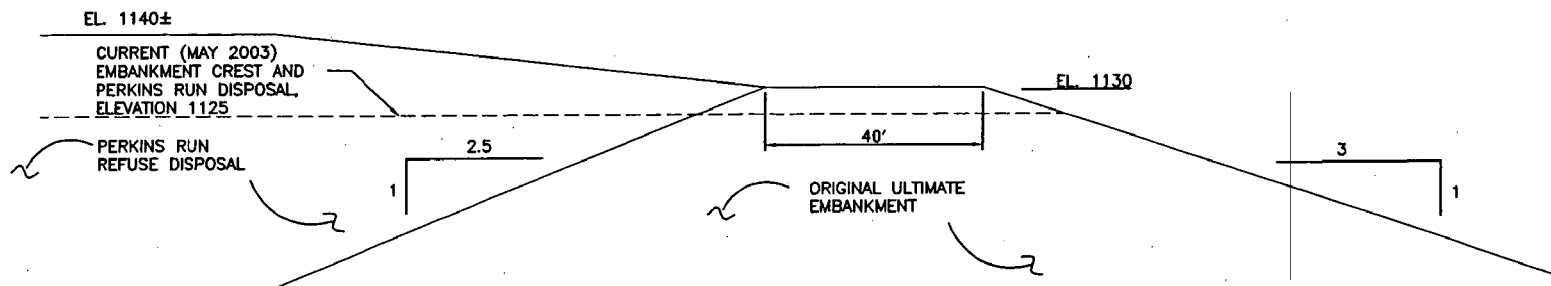
EMBANKMENT RAISING
NO. 2 SLURRY DAM

DESIGNED BY: TAM
DRAWN BY: JLS
CHECKED BY:
APPROVED BY: ADH

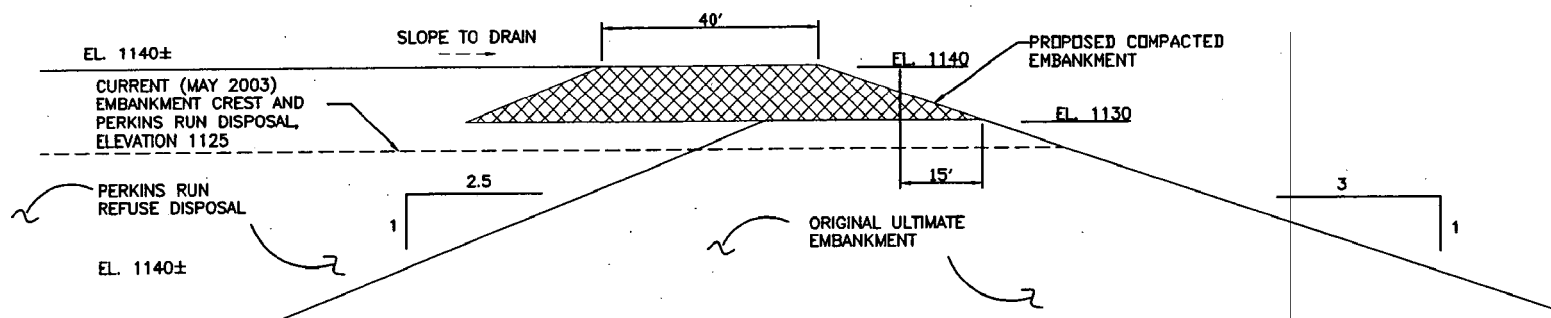
JOB NUMBER: 0321-0002.00
SCALE:
DATE: MAY 21, 2003
REVISED:

PROFILE PROPOSED SPILLWAY
CONTROL SILL





ORIGINAL ULTIMATE EMBANKMENT CROSS SECTION



PROPOSED ULTIMATE EMBANKMENT CROSS SECTION



DLZ Ohio, Inc.
6121 Huxley Road • Columbus, Ohio 43229-1003
Phone (614) 883-0040 • Fax (614) 848-6711
www.dlzc.com

OHIO VALLEY COAL CO.

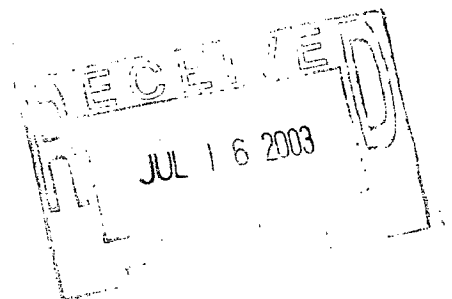
EMBANKMENT RAISING
NO. 2 SLURRY DAM

DESIGNED BY:	NO. 2 SLURRY DAM
DRAWN BY:	SCALE:
CHECKED BY:	DATE: MAY 21, 2003
APPROVED BY: AEM	REVIEWED:

EMBANKMENT CROSS SECTIONS



Control Sill Wall Design Calculations

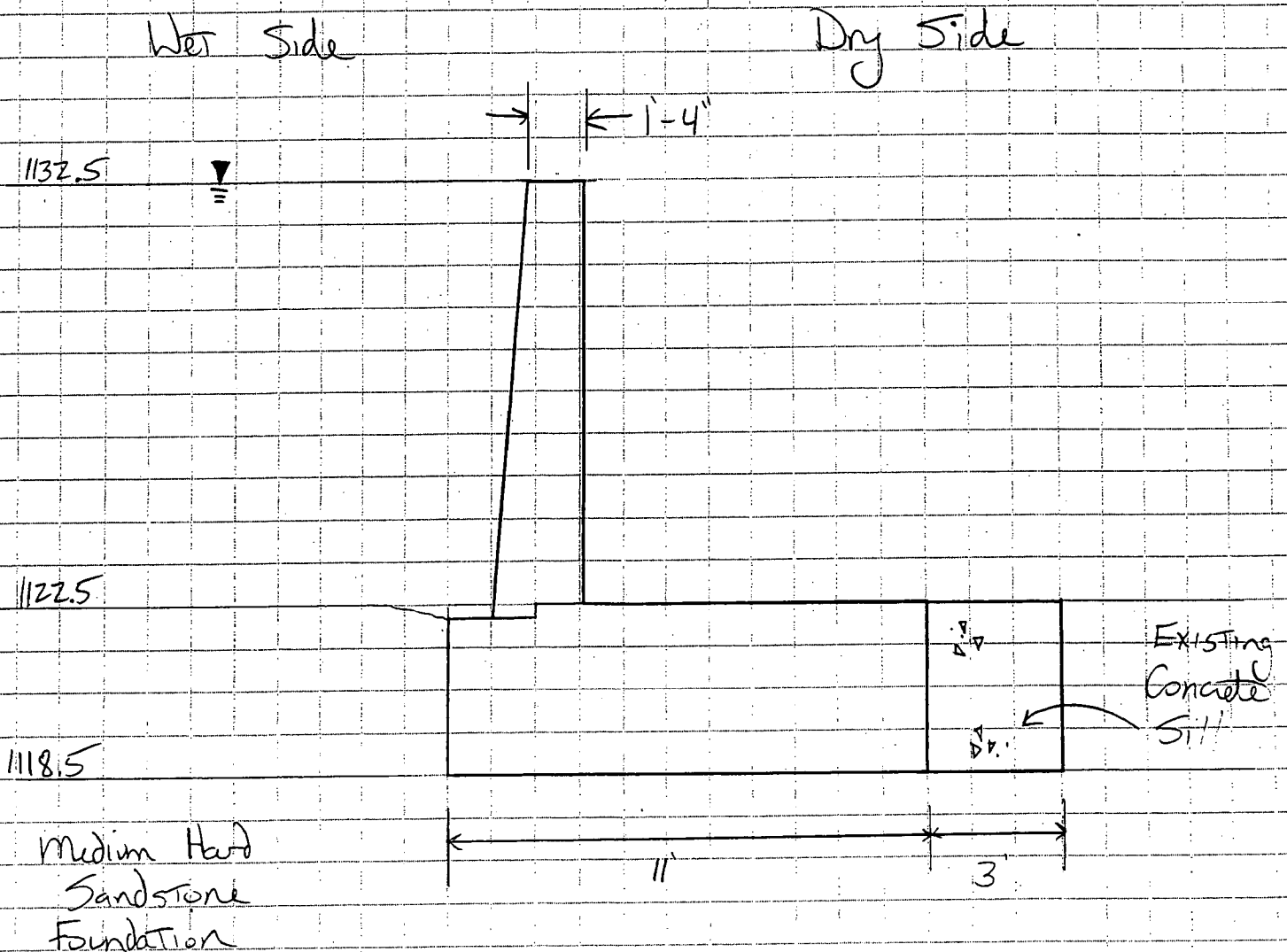




CLIENT OVC
PROJECT OVC Cantilever Wall
SUBJECT Preliminary Wall Cross-Section

PROJECT NO. 0321-3002.00
SHEET NO. 1 OF 1
COMP. BY TRM DATE 4-16-03
CHECKED BY _____ DATE _____

- Initial wall design concept



CLIENT Ohio Valley CoalPROJECT Dam No. 2SUBJECT Spillway Concrete Floodwall DesignPROJECT NO. 032-2262-00SHEET NO. 1

OF

COMP. BY TAKDATE 12-79-03

CHECKED BY

DATE

- Per Pete Nix (geotech) the following information is to be used for the design of the new wall:

1) Wall is to be founded in the medium hard sandstone generally encountered below elevation 1118.5

2) Usual loading is pool at elevation 1130.0 on the back of the wall, no pool on the front of the wall

3) Extreme loading is pool at elevation 1132.5 on the back of the wall, no pool on the front of the wall

4) Top of new wall is to be at elevation 1132.5

- Design the floodwall per EM 1110-2-2502, "Retaining and Floodwalls", EM 1110-2-2104, "Strength Design for Reinforced-Concrete Hydraulic Structures", and ACI 318-99.

- Use 4000 psi concrete and grade 60 rebar

* - Also per Pete Nix (geotech) assume the ^{hydrostatic} uplift pressure has a triangular distribution with pressure equal to the hydrostatic head on the back of the wall (heel) and pressure equal to zero at the front of the wall (toe).

is caused by water only and

- See following two spread sheets for wall dimensions and load conditions. Included are wind load conditions for end of construction assuming a wind pressure of 60 psf

* - Also per Pete Nix assume that lateral load on the wall is due to concrete reaction with a sloped (horizontal) and $\phi = 32^\circ$.
Tried to find a good way to do it - w/ water i.e. lateral water pressure = $62.4 \times h_o (130-62.4)$

DLZ

CLIENT Ohio Valley Coal
 PROJECT Dam No. 2
 SUBJECT Spillway Cantilever FloodWall Design
 Normal Pool Conditions

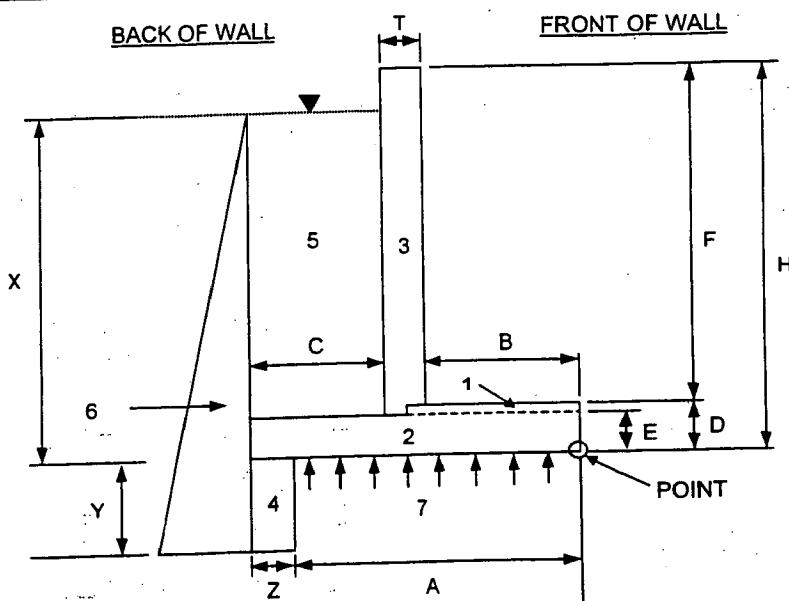
PROJECT NO. 0321-3002.00
 SHEET NO. 1 OF 2
 COMPUTED BY TAH DATE 5/19/2003
 CHECKED BY DATE

A = 14.50 FT
 C = 6.00 FT
 D = 4.00 FT
 E = 3.75 FT
 H = 14.00 FT
 T = 1.92 FT
 X = 11.50 FT
 Y = 2.00 FT
 Z = 1.50 FT

B = 8.08 FT
 F = 10.00 FT

BOTTOM OF FOOTING ELEV. = 1118.50 FT
 GROUND ELEV. (FRONT) = 1118.50 FT
 SLUDGE ELEV. (BACK) = 1130.00 FT

WEIGHT/AREA OF CONCRETE. = 0.150 KSF
 WEIGHT/AREA OF SLUDGE = 0.130 KSF
 $K_o = 1 - \sin = 0.470$
 WEIGHT/AREA OF WATER = 0.062 KSF

**RESISTING FORCES AND MOMENTS:**

*C.G. TAKEN FROM POINT "O"

AREA	MATERIAL	HEIGHT (FT)	WIDTH (FT)	WT/FT ² (KSF)	WEIGHT (KIP)	C.G.* (FT)	MOMENT (KIP-FT)
1	CONCRETE FOOT.	0.25	8.08	0.150	0.303	4.04	1.225
2	CONCRETE FOOT.	3.75	16.00	0.150	9.000	8.00	72.000
3	CONCRETE WALL	10.00	1.92	0.150	2.876	9.04	25.999
4	CONCRETE KEY	2.00	1.50	0.150	0.450	15.25	6.863
5	SLUDGE, BACK	7.75	6.00	0.130	6.045	13.00	78.585

M(R) = 184.671 KIP-FT

OVERTURNING FORCES AND MOMENTS

$$13.5(62.4 + .47(130 - 62.4))$$

AREA	MATERIAL	HEIGHT (FT)	LAT. LD (KIP/FT)	TOT. LD (KIP)	C.G.* (FT)	MOMENT (KIP-FT)
6	SLUDGE PRESSURE, OT	13.50	1.27	8.581	2.50	-21.454
7	WATER PRESSURE, UPLIFT***	13.50	0.84	6.739	10.67	-71.885

M(OT) = 93.338 KIP-FT

$$\Sigma \text{VERTICAL FORCES} = \Sigma W = 11.934 \quad \Sigma M = 91.333$$

*** - Assumes a triangular uplift pressure distribution with pressure = 0 ksf at point "O".

BEARING:RESULTANT (FROM POINT "O") = $\Sigma M / \Sigma W = 7.653$ FT (O.K. WITHIN THE CENTER 1/3 OF FOOTING)

$$e = (A+Z)/2 - \text{RESULTANT} = 0.347 \text{ FT}$$

$$I = (1/12) * (1 \text{ FT}) * (A+Z)^3 = 341.333 \text{ FT}^4$$

$$P = \Sigma W / (A+Z) (+/-) (\Sigma W * e * (1/2) * (A+Z)) / I$$

$$P(\text{MAX}) = 0.843 \text{ KSF}$$

$$P(\text{MIN}) = 0.649 \text{ KSF}$$

$$P(\text{ALLOW}) = \text{ALLOWABLE BEARING CAPACITY} = 3.000 \text{ KSF}$$

$$P(\text{ALLOW}) / P(\text{MAX}) = 3.559 \quad (\text{O.K., BEARING CAPACITY F.S.} > 3.0)$$

(EM 1110-2-2502, Page 4-6)

OVERTURNING:

$$\% \text{ BASE IN COMPRESSION} = 100\%$$

(O.K. ENTIRE BASE IN COMPRESSION)
(EM 1110-2-2502, Page 4-6)**SLIDING:**

$$\text{DRIVING FORCE} = 8.581 \text{ KIPS}$$

$$\text{FACTOR OF SAFETY} = 1.50$$

(EM 1110-2-2502, Page 4-6)

$$\text{DESIGN DRIVING FORCE} = 12.872 \text{ KIPS}$$

CONSERVATIVELY DESIGN THE KEY TO RESIST THE ENTIRE DESIGN DRIVING FORCE

DLZ

CLIENT Ohio Valley Coal
 PROJECT Dam No. 2
 SUBJECT Spillway Cantilever FloodWall Design
Extreme Pool Conditions

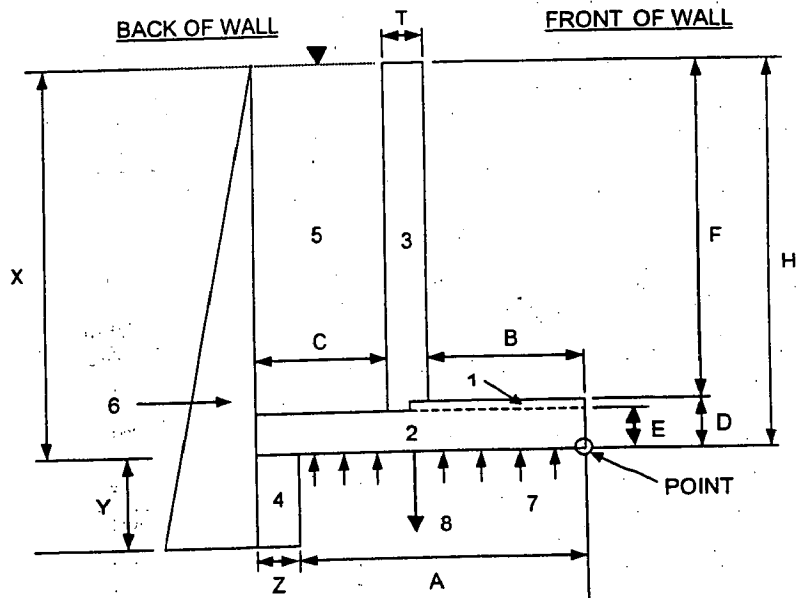
PROJECT NO. 0321-3002.00
 SHEET NO. 1 OF 2
 COMPUTED BY TAH DATE 5/19/2003
 CHECKED BY _____ DATE _____

A = 14.50 FT
 C = 6.00 FT
 D = 4.00 FT
 E = 3.75 FT
 H = 14.00 FT
 T = 1.92 FT
 X = 14.00 FT
 Y = 2.00 FT
 Z = 1.50 FT

 B = 8.08 FT
 F = 10.00 FT

BOTTOM OF FOOTING ELEV. = 1118.50 FT
 GROUND ELEV. (FRONT) = 1118.50 FT
 SLUDGE ELEV. (BACK) = 1132.50 FT

WEIGHT/AREA OF CONCRETE. = 0.150 KSF
 WEIGHT/AREA OF SLUDGE = 0.130 KSF
 $K_0 = 1 - \sin \phi = 0.470$
 WEIGHT/AREA OF WATER = 0.062 KSF

**RESISTING FORCES AND MOMENTS:**

*C.G. TAKEN FROM POINT "O"

AREA	MATERIAL	HEIGHT (FT)	WIDTH (FT)	WT/FT ² (KSF)	WEIGHT (KIP)	C.G.* (FT)	MOMENT (KIP-FT)
1	CONCRETE FOOT.	0.25	8.08	0.150	0.303	4.04	1.225
2	CONCRETE FOOT.	3.75	16.00	0.150	9.000	8.00	72.000
3	CONCRETE WALL	10.00	1.92	0.150	2.876	9.04	25.999
4	CONCRETE KEY	2.00	1.50	0.150	0.450	15.25	6.863
5	SLUDGE, BACK	10.25	6.00	0.130	7.995	13.00	103.935
8	ROCK ANCHOR	N/A	N/A	N/A	0.000	9.04	0.000

M(R) = 210.021 KIP-FT

OVERTURNING FORCES AND MOMENTS

AREA	MATERIAL	HEIGHT (FT)	LAT. LD. (KIP/FT)	TOT. LD. (KIP)	C.G.* (FT)	MOMENT (KIP-FT)
6	SLUDGE PRESSURE, OT	16.00	1.5*	12.054	3.33	-40.180
7	WATER PRESSURE, UPLIFT***	16.00	1.00	7.987	10.67	-85.197

M(OT) = 125.377 KIP-FT

 $\Sigma \text{VERTICAL FORCES} = \Sigma W = 12.636$ $\Sigma M = 84.645$

*** - Assumes a triangular uplift pressure distribution with pressure = 0 psf at point "O".

BEARING:

RESULTANT (FROM POINT "O") = $\Sigma M / \Sigma W = 6.698$ FT
 $e = (A+Z)/2 - \text{RESULTANT} = 1.302$ FT
 $I = (1/12)(1 \text{ FT})(A+Z)^3 = 341.333$ FT⁴

(WITHIN THE CENTER 1/3 OF FOOTING)

$$P = \Sigma W / (A+Z) (+/-) (\Sigma W \cdot e \cdot (1/2) \cdot (A+Z)) / I$$

P(MAX) = 1.175 KSF
 P(MIN) = 0.404 KSF

P(ALLOW) = ALLOWABLE BEARING CAPACITY = 3.000 KSF

P(ALLOW) / P(MAX) = 2.553 (O.K., BEARING CAPACITY F.S. > 2.0)
 (EM 1110-2-2502, Page 4-6)

OVERTURNING:

% BASE IN COMPRESSION = 100%

(O.K. ENTIRE BASE IN COMPRESSION!)
 (EM 1110-2-2502, Page 4-6)

SLIDING:

DRIVING FORCE = 12.054 KIPS
 FACTOR OF SAFETY = 1.33 (EM 1110-2-2502, Page 4-6)
 DESIGN DRIVING FORCE = 16.032 KIPS
 CONSERVATIVELY DESIGN THE KEY TO RESIST THE ENTIRE DESIGN DRIVING FORCE

5/22/2003 - 8:30 AM

OVC RetainingWallDesign-Extreme.xls\MOMENTS

TOVCC 19949

DLZ

CLIENT Ohio Valley Coal
 PROJECT Dam No. 2
 SUBJECT Spillway Cantilever FloodWall Design
 End of Construction Conditions - With Wind
 on front of wall

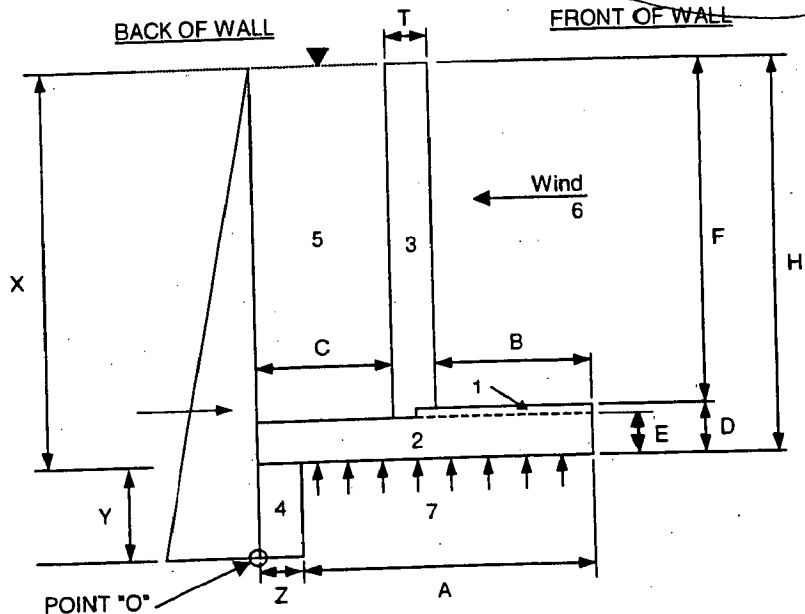
PROJECT NO. 0321-3002.00
 SHEET NO. 1 OF 1
 COMPUTED BY TAH DATE 5/1/2003
 CHECKED BY BEK DATE 5/14/03

A = 14.50 FT
 C = 6.00 FT
 D = 4.00 FT
 E = 3.75 FT
 H = 14.00 FT
 T = 1.92 FT
 X = 14.00 FT
 Y = 2.00 FT
 Z = 1.50 FT

B = 8.08 FT
 F = 10.00 FT

BOTTOM OF FOOTING ELEV. = 1118.50 FT
 GROUND ELEV. (FRONT) = 1118.50 FT
 WATER ELEV. (BACK) = 1132.50 FT

WEIGHT/AREA OF CONCRETE = 0.150 KSF
 WEIGHT/AREA OF WATER = 0.062 KSF
 PRESSURE/AREA OF WIND = 0.060 KSF

**RESISTING FORCES AND MOMENTS:**

*C.G. TAKEN FROM POINT "O"

AREA	MATERIAL	HEIGHT (FT)	WIDTH (FT)	WT/FT ² (KSF)	WEIGHT (KIP)	C.G.* (FT)	MOMENT (KIP-FT)
1	CONCRETE FOOT.	0.25	8.08	0.150	0.303	11.96	3.625
2	CONCRETE FOOT.	3.75	16.00	0.150	9.000	8.00	72.000
3	CONCRETE WALL	10.00	1.92	0.150	2.876	6.96	20.013
4	CONCRETE KEY	2.00	1.50	0.150	0.450	0.75	0.338
5	WATER, BACK	0.00	6.00	0.062	0.000	13.00	0.000

M(R) = 95.976 KIP-FT**OVERTURNING FORCES AND MOMENTS**

AREA	MATERIAL	HEIGHT (FT)	LAT. LD. (KIP/FT)	TOT. LD. (KIP)	C.G.* (FT)	MOMENT (KIP-FT)
6	WIND PRESSURE, OT	10.25	0.06	-0.615	1.38	-0.846
7	WATER PRESSURE, UPLIFT***	0.00	0.00	0.000	10.67	0.000

M(OT) = -0.846 KIP-FT

$\Sigma \text{VERTICAL FORCES} = \Sigma W = 12.629$ $\Sigma M = 95.131$

*** - Assumes a triangular uplift pressure distribution with pressure = 0 ksf at point "O".

BEARING:

RESULTANT (FROM POINT "O") = $\Sigma M / \Sigma W = 7.533$ FT (O.K. WITHIN THE CENTER 1/3 OF FOOTING)
 $e = (A+Z)/2 - \text{RESULTANT} = 0.467$ FT
 $I = (1/12) * (1 \text{ FT}) * (A+Z)^3 = 341.333 \text{ FT}^4$

$P = \Sigma W / (A+Z) (+/-) (\Sigma W * e * (1/2) * (A+Z)) / I$
 $P(\text{MAX}) = 0.928 \text{ KSF}$
 $P(\text{MIN}) = 0.651 \text{ KSF}$

$P(\text{ALLOW}) = \text{ALLOWABLE BEARING CAPACITY} = 3.000 \text{ KSF}$

$P(\text{ALLOW}) / P(\text{MAX}) = 3.234$

OVERTURNING:

% BASE IN COMPRESSION = 100%

(O.K. ENTIRE BASE IN COMPRESSION)
 (EM 1110-2-2502, Page 4-6)

SLIDING:

DRIVING FORCE = -0.615 KIPS
 FACTOR OF SAFETY = 1.50 (EM 1110-2-2502, Page 4-6)
 DESIGN DRIVING FORCE = -0.923 KIPS
 CONSERVATIVELY DESIGN THE KEY TO RESIST THE ENTIRE DESIGN DRIVING FORCE

DLZ

CLIENT Ohio Valley Coal
 PROJECT Dam No. 2
 SUBJECT Spillway Cantilever FloodWall Design
 End of Construction Conditions - With Wind
 on back of wall

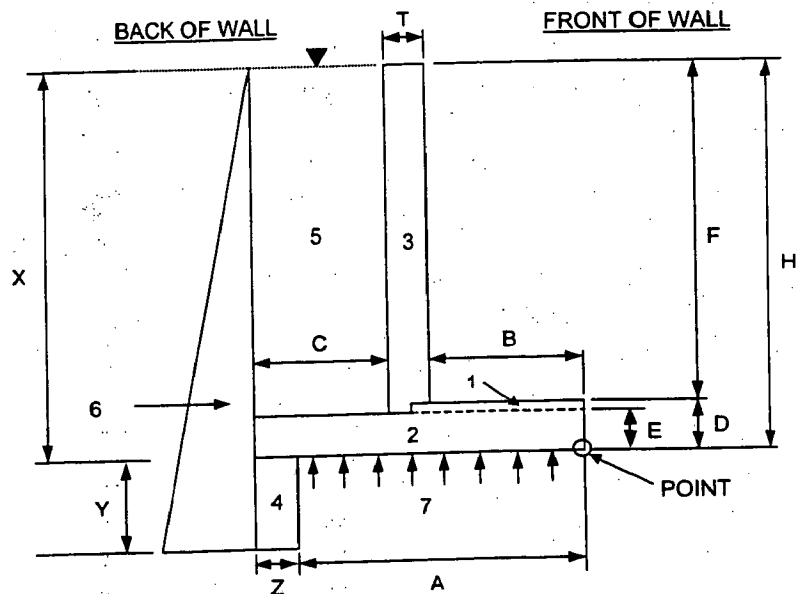
PROJECT NO. 0321-3002.00
 SHEET NO. 1 OF 1
 COMPUTED BY TAH DATE 5/1/2003
 CHECKED BY DATE

A = 14.50 FT
 C = 6.00 FT
 D = 4.00 FT
 E = 3.75 FT
 H = 14.00 FT
 T = 1.92 FT
 X = 14.00 FT
 Y = 2.00 FT
 Z = 1.50 FT

B = 8.08 FT
 F = 10.00 FT

BOTTOM OF FOOTING ELEV. = 1118.50 FT
 GROUND ELEV. (FRONT) = 1118.50 FT
 WATER ELEV. (BACK) = 1132.50 FT

WEIGHT/AREA OF CONCRETE = 0.150 KSF
 WEIGHT/AREA OF WATER = 0.062 KSF
 PRESSURE/AREA OF WIND = 0.060 KSF



RESISTING FORCES AND MOMENTS:

*C.G. TAKEN FROM POINT "P"

AREA	MATERIAL	HEIGHT (FT)	WIDTH (FT)	WT/FT ² (KSF)	WEIGHT (KIP)	C.G.* (FT)	MOMENT (KIP-FT)
1	CONCRETE FOOT.	0.25	8.08	0.150	0.303	4.04	1.225
2	CONCRETE FOOT.	3.75	16.00	0.150	9.000	8.00	72.000
3	CONCRETE WALL	10.00	1.92	0.150	2.876	9.04	25.999
4	CONCRETE KEY	2.00	1.50	0.150	0.450	15.25	6.863
5	WATER, BACK	0.00	6.00	0.062	0.000	13.00	0.000

M(R) = 106.086 KIP-FT

OVERTURNING FORCES AND MOMENTS

AREA	MATERIAL	HEIGHT (FT)	LAT. LD. (KIP/FT)	TOT. LD. (KIP)	C.G.* (FT)	MOMENT (KIP-FT)
6	WIND PRESSURE, OT	10.25	0.06	0.615	8.88	-5.458
7	WATER PRESSURE, UPLIFT***	0.00	0.00	0.000	10.67	0.000

M(OT) = 5.458 KIP-FT

ΣVERTICAL FORCES = ΣW = 12.629 ΣM = 100.628

*** - Assumes a triangular uplift pressure distribution with pressure = 0 ksf at point "O".

BEARING:

RESULTANT (FROM POINT "O") = ΣM/ΣW = 7.968 FT (O.K. WITHIN THE CENTER 1/3 OF FOOTING)
 $e = (A+Z)/2 - \text{RESULTANT} = 0.032 \text{ FT}$
 $I = (1/12) * (1 \text{ FT}) * (A+Z)^3 = 341.333 \text{ FT}^4$

$P = \Sigma W / (A+Z) (+/-) (\Sigma W * e * (1/2) * (A+Z)) / I$
 P(MAX) = 0.799 KSF
 P(MIN) = 0.780 KSF

P(ALLOW) = ALLOWABLE BEARING CAPACITY = 3.000 KSF
 P(ALLOW) / P(MAX) = 3.756

OVERTURNING:

% BASE IN COMPRESSION = 100%

(O.K. ENTIRE BASE IN COMPRESSION)
 (EM 1110-2-2502, Page 4-6)

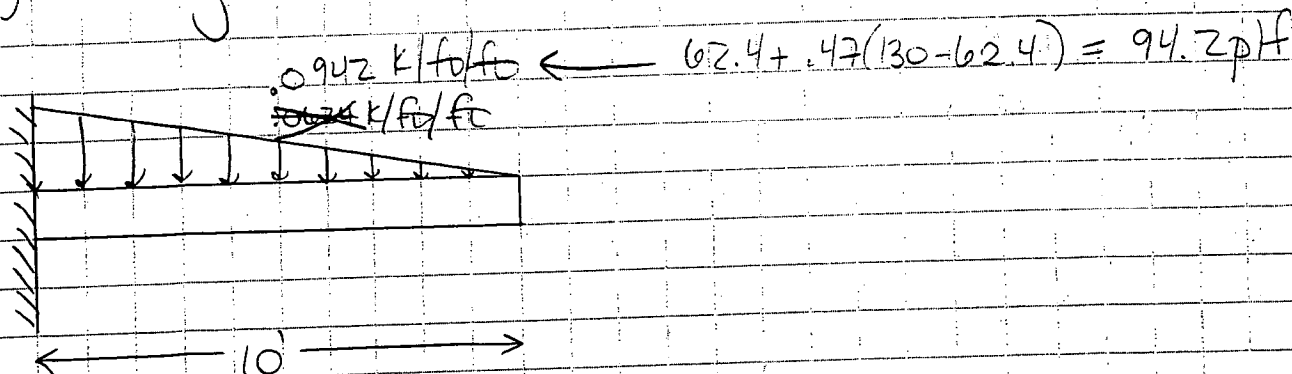
SLIDING:

DRIVING FORCE = 0.615 KIPS
 FACTOR OF SAFETY = 1.50 (EM 1110-2-2502, Page 4-6)
 DESIGN DRIVING FORCE = 0.923 KIPS
 CONSERVATIVELY DESIGN THE KEY TO RESIST THE ENTIRE DESIGN DRIVING FORCE

CLIENT Ohio Valley Co.
 PROJECT Dam No. 20
 SUBJECT Spillway Cantilever Floodwall Design

PROJECT NO. 050-3002.00
 SHEET NO. 24 OF 34
 COMP. BY TRM DATE 4-25-03
 CHECKED BY _____ DATE _____

- Design bending moment at base of wall (per foot of wall):



$$M_{max} = \frac{wl^3}{6} = \frac{(0.0942 \text{ k/ft})(10')^3}{6} = 15.7 \text{ k-ft/ft of wall}$$

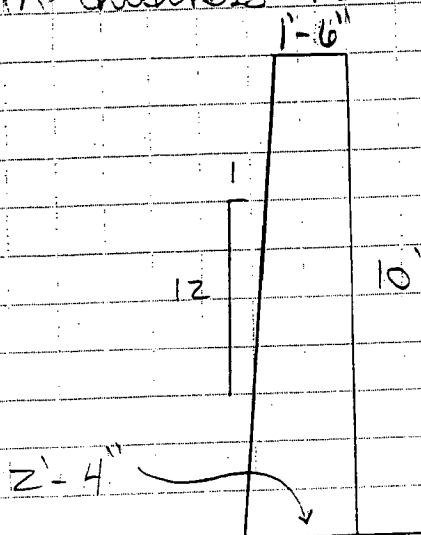
$$V_{max} = \frac{wl^2}{2} = \frac{(0.0942 \text{ k/ft})(10')^2}{2} = 4.71 \text{ k/ft of wall}$$

- Conservatively factor these loads as live loads, i.e. per EM-1110-2-2502, section 9-8(c), use

$$M_u = 1.9 M_{max} = 1.9 (15.7 \text{ k-ft}) = 29.8 \text{ k-ft/ft of wall}$$

$$V_u = 1.9 V_{max} = 1.9 (4.71 \text{ k}) = 9.0 \text{ k/ft of wall}$$

- Base wall design on 1'-6" thickness at top and increasing in thickness 12:1 (V:H) over entire height of wall

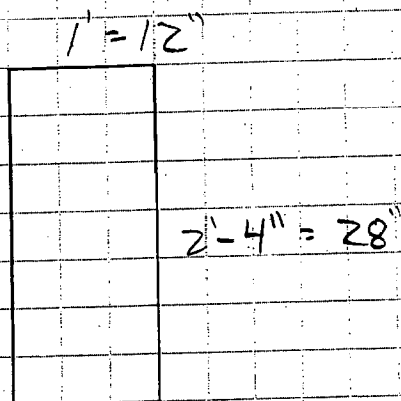




CLIENT OVC
 PROJECT Dam No. 2
 SUBJECT Spillway Cantilever Floodwall

PROJECT NO. 0321-3002.00
 SHEET NO. 5 OF 5
 COMP. BY TAM DATE 5-1-03
 CHECKED BY _____ DATE _____

- Therefore, the critical section at the base of the wall is shown below:



- Per EM 1110-2-2104, Section 2-6, minimum concrete cover shall be 3"

- For design, Try #6 bars @ 18" c/c w/ 3" cover. Use Army Corps of Engineers design program CASTR, to check design. Steel per linear foot of wall = $(.44 \text{ in}^2) \times (12/18) = .293 \text{ in}^2$

- This design is adequate for bending. See attached computer printouts. *Even with increased bending moments! * See following sheet *

- Since this is a column (i.e. flexural member), must have:

$$p > \frac{200}{F_y}$$

$$p = \frac{A_{\text{steel}}}{bd} = \frac{.293 \text{ in}^2}{(12") \times (28" - 3.375")} = .00099$$

$$\frac{200}{F_y} = \frac{200}{60,000} = .00333 > .00099 \quad \text{No Good!!!}$$

- Therefore, increase steel area by $\frac{1}{3}$

$$A_s = \frac{1}{3} (.293 \text{ in}^2) = .391 \text{ in}^2 / \text{ft}$$

- Use #6 bars @ 12" c/c !!!

*

X0067 - User's Guide for Concrete Strength Investigation and Design
(CASTR) in Accordance with ACI 318-89

Output - X0067

Dimensions of Concrete Section

Width(B)	Height(H)
inches	inches
12.000	28.000

Reinforcement Areas and Positions

Layer No.	No.	Bars	Area Bar	Y (in.)	X1 (in.)	X2 (in.)
1	1	1	0.29	3.38	6.00	6.00
2	1	1	0.29	24.63	6.00	6.00

Material Constants

$F'_C = 4.000$ ksi
 $F_Y = 60.000$ ksi

Factor $p\text{-max}/p\text{-bal}$, $PEROB = 0.375$

Analysis follows ACI Code 318-89:

Stress Block Depth Ratio, $B1 = 0.850$
Maximum Concrete Strain, $EMAX = 0.003000$
Concrete Stress Ratio f_c/f_c , $FCR = 0.8500$
Phi for Flexure, $PHIF = 0.900$
Phi for Axial Load, $PHIA = 0.700$

ACI Code 318-89:

Required Strength

$P(U) = 0.0$ k $PHI = 0.9000$
 $M(U) = 25.3$ k-ft $ASTOT/B \cdot H = 0.0017$

Results

Section falls within admissible range.
Meets input data reinforcement limit requirement.

Minimum D for no comp steel = 6.96 inches

61.85 % of design strength used, in
tensile zone. ←

**

$$\frac{25.3 \text{ k-ft}}{0.6185} = 40.91 \text{ k-ft}$$

allowable design
moment

$$\therefore \frac{29.8 \text{ k-ft}}{40.91 \text{ k-ft}} = 72.9\% \text{ of}$$

design strength used, in
Tensile zone.

CLIENT OVC
 PROJECT Dam No. 2
 SUBJECT Spillway Cantilever Wall Design

PROJECT NO. 0321-3002.00
 SHEET NO. 6 OF 6
 COMP. BY TRW DATE 5-1-03
 CHECKED BY _____ DATE _____

- Shear at base of wall

- shear strength provided by concrete alone
 (ACI 318-99, Section 11.3.1.1)

$$\phi V_c = \phi 2 \sqrt{f'_c} b_w d$$

$$= (0.85)(2)(\sqrt{4000})(12'')(26'' - 3.375'')$$

$$= \frac{29,191 \text{ lbs}}{F.S. = 2.0} = 14.6 \text{ kips} >> 5.9 \text{ kips} \quad *$$

- Therefore, provide minimum shear reinforcement
 (which #6's @ 12" c/c do).

Wind loading on wall (no pool - just after construction)

Consider a uniformly applied wind load over the entire face of the wall. Determine wind velocity that would correspond to the calculated bending moment and shear ($M = 10.4 \text{ K-ft}$, $V = 3.42 \text{ K}$)

$$M = \frac{W L^2}{2} = \frac{W (10')^2}{2} = 10.4 \text{ K-ft} \Rightarrow W = \frac{2.08 \text{ Kips/ft}}{10'}$$

(over a 1' wide section of wall is 2.08 lbs/ft^2)

$$V = W L = W (10') = 3.42 \text{ K} \Rightarrow W = \frac{3.42 \text{ Kips/ft}}{10'}$$

(over a 1' wide section of wall is 3.42 lbs/ft^2)

3.42 lbs/ft^2 is more than conservative for wind loading O.K!!
 (See EM110-2-2502 Section 3-25, which recommends 3.0 lbs/ft^2)

CLIENT One Valley Coal
 PROJECT Dam No 2
 SUBJECT Spillway Cantilever floodwall

PROJECT NO. 0321-3002.00
 SHEET NO. 87 OF 87
 COMP. BY AKH DATE 5-1-03
 CHECKED BY _____ DATE _____

Key Design

- Assume key carries the entire design shear load

$$V = 1.9(7.987K) = 15.2 K / ft \text{ of wall}$$

- width of key = 1.5'

- shear strength provided by concrete alone:

$$\phi V_c = \phi 2 \sqrt{f'_c} b w d$$

$$= (.85)(2)(\sqrt{4000})(12")(18"-3"- \frac{7.5}{2})$$

assume #6 bars in key

$$= 18869 \text{ lbs} = 18.9 \text{ kips / foot of wall} < 19.5 \text{ kips / ft}$$

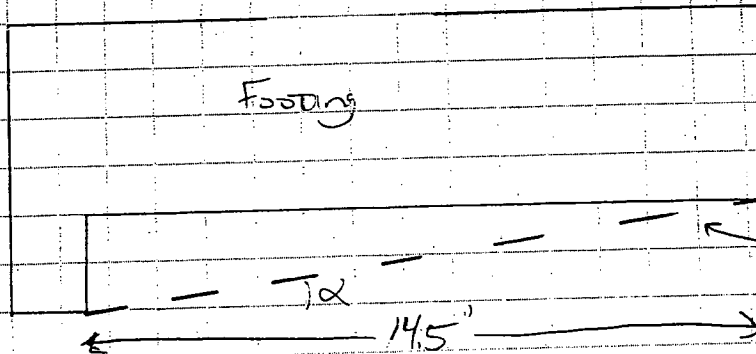
- Therefore provide shear reinforcement in key. Per ACI 11.5.6.2

$$A_v = \frac{V_u S}{f_y d} = \frac{(22,900 \text{ lbs})(12")}{(60,000 \text{ psi})(18"-3"- \frac{7.5}{2})} = .313 \text{ in}^2 / \text{ft of wall} \Rightarrow \text{provide #6's @ 12"}$$

- Shearing of rock:

- Assume the shear failure plane shown below:

$$\alpha = \tan^{-1}\left(\frac{2'}{14.5'}\right) = 7.9^\circ$$



Conservative shear failure plane in rock

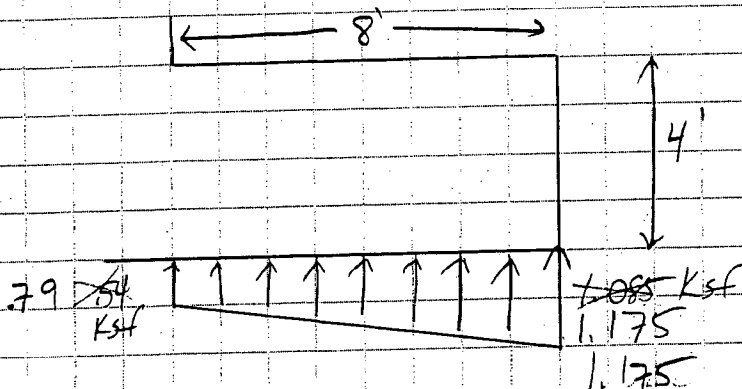
$$\text{length of failure plane} = L = \frac{14.5'}{\cos 7.9^\circ} = 14.6'$$

$$\text{shear strength of rock (conservative)} = 5,000 \text{ psf} = 5 \text{ ksf}$$

$$\text{shear resistance in rock} = (5 \text{ ksf})(14.6')(1) = 73.2 \text{ kips} >> 19.5 \text{ kips} \quad \text{OK!!}$$

- Bending reinforcement in toe at face of wall

Consider the extreme pool conditions



- P_{max} from stability calcs = ~~1.085~~ Ksf

- P_{min} from stability calcs = .404 Ksf

over distance = $A + \bar{x} = 14.5 + 1.5 = 16 \text{ feet}$

slope of bearing pressure line = $\frac{1.175 - .404}{16 \text{ ft}} = .0482 \text{ K/ft}^3$

- over width of toe = $8: 1.175 - (8')(.0482 \text{ K/ft}^3) = .789 \text{ Ksf}$
 at face of wall

- weight of toe = $(4' \times 1' \times 8')(.150 \text{ Ksf}) = 4.8 \text{ Kips}$ located 4' from wall

- centroid of bearing pressure from wall:

$$\bar{y} = \frac{(8')(1.175 - .790)(\frac{2}{3})(8') + (.54)(8')(1')(\frac{1}{2})(8')}{(8')(1.175 - .790)(1') + (.54)(8')(1')}$$

$$\bar{y} = \frac{41.71}{9.40} = 4.44'$$

- Bending moment in toe: $[(8')(1.175 - .790)(1') + (.54)(8')(1')](4.44') - (4.8 \text{ Kips})(4')$

$$= 22.54 \text{ K-ft}$$

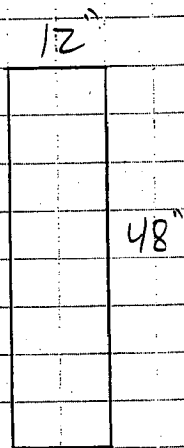
CLIENT CVC
 PROJECT Dam No. 2
 SUBJECT Spilling Canal Flood wall
Desur

PROJECT NO. 1003-00
 SHEET NO. 1 OF 1
 COMP BY TR4 DATE 5-1-03
 CHECKED BY DATE

- Again conservatively factor this moment as a live load

$$M_u = 1.9 M = 1.9 (21.36 \text{ K-ft}) = 40.5 \text{ K-ft}$$

- Run this load through Army Corps concrete design program CASTR. Assume 3" concrete cover, 4000 psi concrete, #6 bars and 12".



- steel per foot: $(.44 \text{ in}^2) \left(\frac{12}{48} \right) = .11 \text{ in}^2/\text{ft} \times \frac{3}{4} = .0825 \text{ in}^2/\text{ft}$

- Section is ok for strength requirements (see attached printouts).
 - Even for a bending moment of 57.8 K-ft (see attached printouts).
 - However, since this is a column (i.e. flexural member) must ensure:

$$p > \frac{200}{F_y} = \frac{.33}{40,000} = .000825$$

$$p = \frac{A_{\text{steel}}}{b d} = \frac{.11 \text{ in}^2/\text{ft}}{(12") (48" - 3.75")} = .00041$$

$$\frac{200}{F_y} = \frac{200}{60,000} = .00333 > .00041 \text{ No Good!}$$

Therefore increase steel Area by $\frac{1}{3}$

$$A_s = \frac{1}{3} (.11 \text{ in}^2/\text{ft}) = .0367 \text{ in}^2/\text{ft}$$

- Use #6 bars @ 12" c/c in wall toe

X0067 - User's Guide for Concrete Strength Investigation and Design
(CASTR) in Accordance with ACI 318-89

Output - X0067

Dimensions of Concrete Section

Width(B)	Height(H)
inches	inches
12.000	48.000

Reinforcement Areas and Positions

Layer No.	No. Bars	Area Bar	Y (in.)	X1 (in.)	X2 (in.)
1	1	0.33	44.63	6.00	6.00

Material Constants

F'C = 4.000 ksi
FY = 60.000 ksi
Factor p-max/p-bal, PEROB = 0.375

Analysis follows ACI Code 318-89:

Stress Block Depth Ratio, B1 = 0.850
Maximum Concrete Strain, EMAX = 0.003000
Concrete Stress Ratio f_c/f_c , FCR = 0.8500
Phi for Flexure, PHIF = 0.900
Phi for Axial Load, PHIA = 0.700

Output - X0067

ACI Code 318-89:

Required Strength

P(U) = 0.0 k PHI = 0.9000
M(U) = 57.8 k-ft ASTOT/B*H = 0.0006

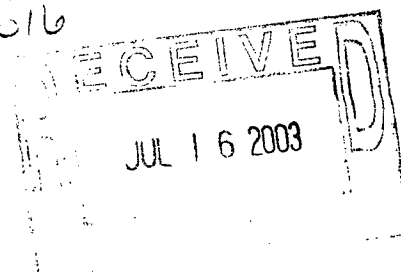
Results

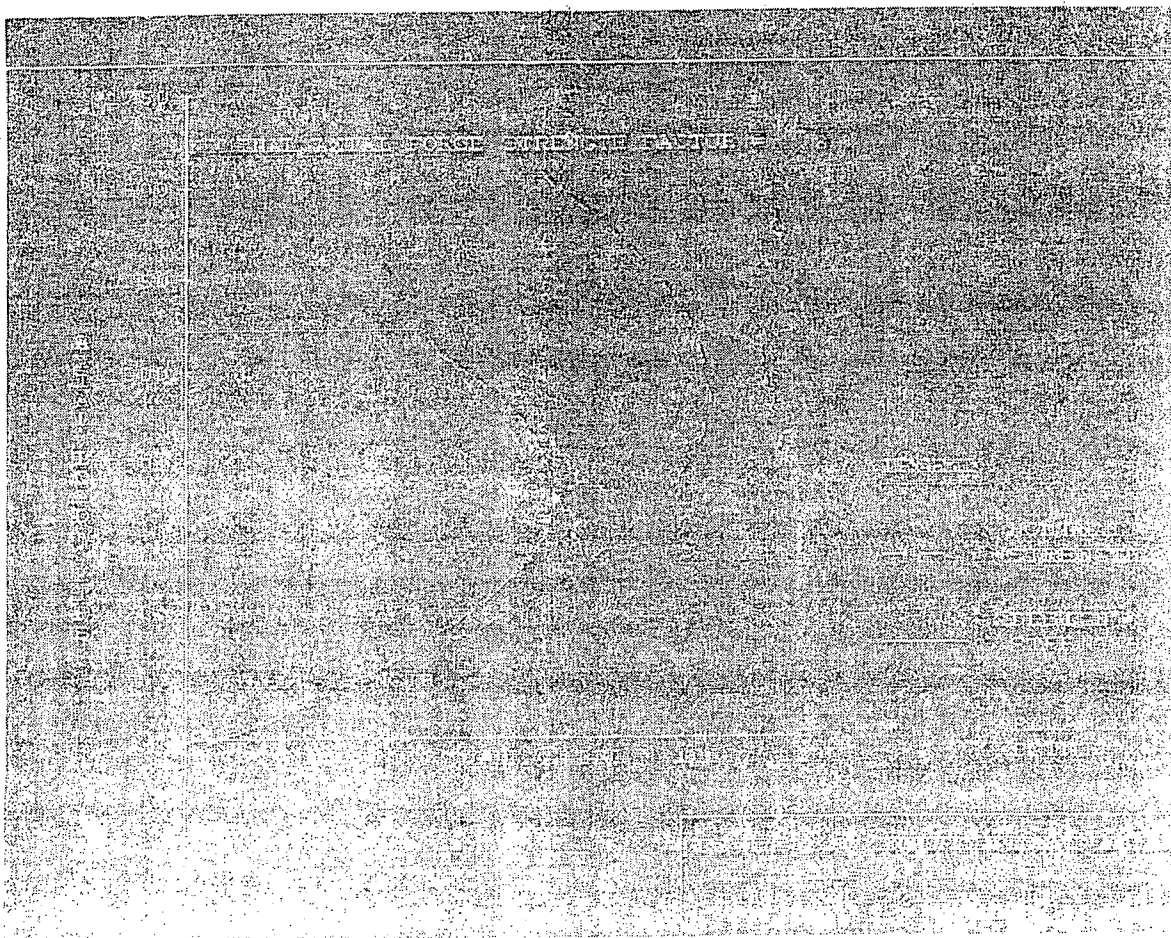
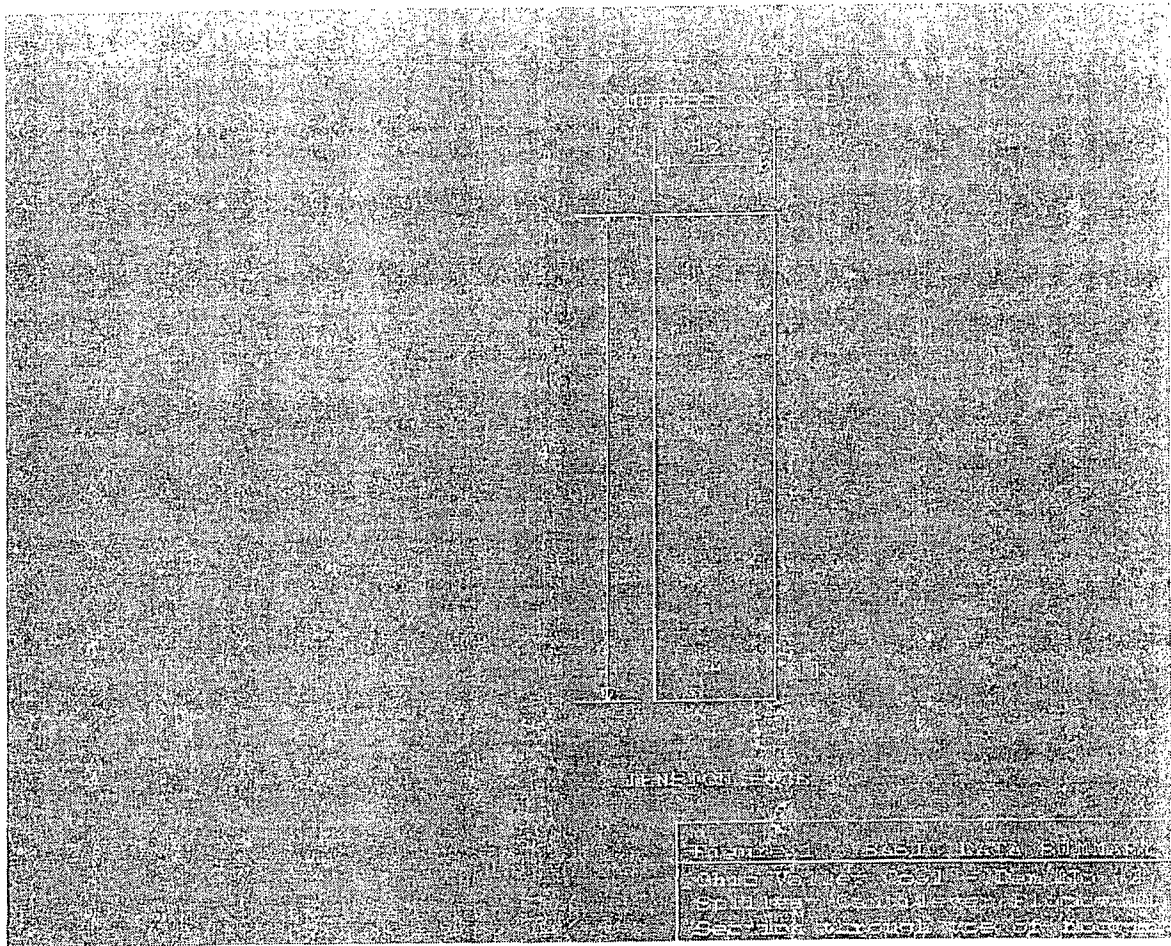
Section falls within admissible range.
Meets input data reinforcement limit requirement.

Minimum D for no comp steel = 10.51 inches

50.16 % of design strength used, in
tensile zone.

57.8 k-ft = 115.2 k-ft
5016





CLIENT OVC
 PROJECT Darr No. 2
 SUBJECT Spillway Cantilever Headwall
Design

PROJECT NO. 002 300702
 SHEET NO. OF
 COMP. BY T-R DATE 5-1-87
 CHECKED BY DATE

- Shear in Toe:

- Resultant shear force in toe and face of wall

$$\left(\frac{1.175 + 1.790}{2} \right) (8')$$

$$V = 7.86 \text{ kips} - 4.8 \text{ kips} \\ = 3.06 \text{ kips} \\ = \underline{3.88 \text{ kips}}$$

conservatively factor this as a line load

$$V_u = 1.9(V) = 1.9(3.88 \text{ kips}) = \underline{7.37 \text{ kips}}$$

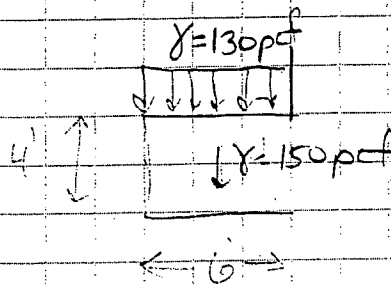
- Shear resistance provided by concrete alone:

$$\phi V_c = \phi 2 \sqrt{f_c} b_w d = (.85)(2)(\sqrt{4000})(12'')(44.63'') \\ = 57582 \text{ lbs} = 57.6 \text{ kips} > \underline{7.37 \text{ kips}} \text{ O.K.} \\ \underline{5.81}$$

- Provide minimal shear reinforcement.

- Bending in heel ****** (Bob: New calcs stand here) ******

- Conservatively ignore hydro pressure and determine bending moment from weight of concrete and coarse rebar on heel



- Bending moment from concrete: $(.4)(6)(1.5)(1-1/3) = 4.8 \text{ k-ft}$

- Bending moment from coarse rebar: $(.4)(6)(1.5)(1/3) = 1.2 \text{ k-ft}$

Factor as above used: $M_u = 1.9(3.4) \text{ k-ft} = 6.46 \text{ k-ft}$

CLIENT _____
PROJECT _____
SUBJECT _____

PROJECT NO. _____
SHEET NO. _____ OF _____
COMP. BY _____ DATE _____
CHECKED BY _____ DATE _____

- Since the design bending moment in the heel ($M_u = 65.0 \text{ k-ft}$) is only slightly less than the design moment for the beam ($M_u = 57.8 \text{ k-ft}$) and since uplift was ignored in the heel and there is reserve capacity in the steel design, mimic steel in the heel:

Use #4 bars @ _____ in the heel

Shear in heel:

Again ignore uplift

- Shear from concrete: $(10)(1)(6)(1.55 \text{ k/ft}) = 9.3 \text{ k}$
- Shear from coarse rebar: $(10)(1)(6)(1.55 \text{ k/ft}) = 9.3 \text{ k}$

Total shear in heel = 11.4 k

Shear resistance provided by concrete alone

$$\phi V_c = \phi 2 \sqrt{f'_c} b_w d = (0.85)(2 \sqrt{4000})(10 \text{ in})(41.67 \text{ in})$$

$$= 53.7 \text{ k} \gg 11.4 \text{ k}$$

- provide minimum shear reinforcement

Hydraulic Evaluations

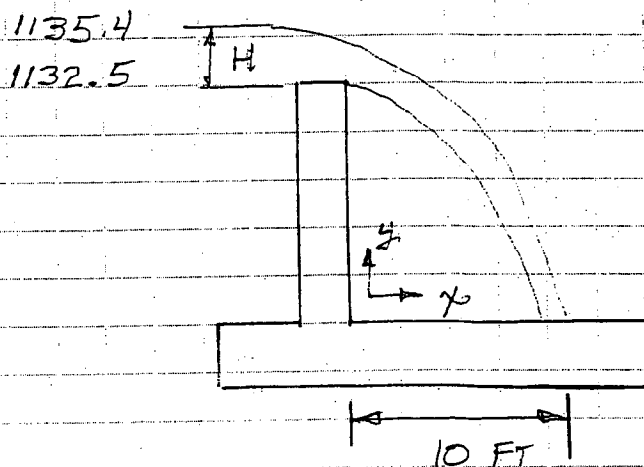
CLIENT OHIO VALLEY COAL CO
PROJECT SLURRY DAM 1/6.2
SUBJECT RAISING

PROJECT NO. _____
SHEET NO. 1 OF 12
COMP. BY MFZ DATE 5/20/03
CHECKED BY _____ DATE _____

BASED ON FLOOD ROUTING OF 36-HR PMF WITH
STARTING POOL AT EL 1130, THE WATER LEVEL WILL
RISE TO 1135.4, WHICH IS 1.6 FT LOWER THAN
ASSUMED 1137.0

CHECK NAPPE PROJECTION FOR $H = 1135.4 - 1132.5$
 $= 2.9 \text{ FT}$

BASED ON THE ATTACHED CALCULATION, THE
CONCRETE APRON SHOULD BE 8.5 - 10 FT BEYOND
THE VERTICAL FACE OF THE WALL



$$x_b/H = 0.15 + 0.055 \left(\frac{x_b}{H} \right) - 0.425 \left(\frac{x_b}{H} \right)^2$$

REF: APPLIED HYDRAULICS IN ENGINEERING
MORRIS & WIGGERT

OHIO VALLEY COAL COMPANY
 SLURRY DAM # 2
 RAISED EMERGENCY SPILLWAY STRUCTURE

Date: 5/20/2003
 By: GFZ

Flow nappe over weir

BOTTOM: $Y_b/H = 0.15 + 0.055*(X_b/H) - 0.425*((X_b/H)^2)$

H =	2.9		
Xb/H	Yb/H	X	Y
1.0	-0.2	2.9	-0.6
1.5	-0.7	4.4	-2.1
2.0	-1.4	5.8	-4.2
2.5	-2.4	7.3	-6.9
3.0	-3.5	8.7	-10.2
3.5	-4.9	10.2	-14.1

TOP: The thickness is equal to a constant ratio of H

$T/H = 0.56$

so $T = 1.624$

The top of the nappe would be approximately 1122.5,
 when the bottom of the nappe is -11.6 (10+1.6)

FLOOD HYDROGRAPH PACKAGE (HEC-1)
JUN 1998
VERSION 4.1

RUN DATE 20MAY03 TIME 14:01:36

U.S. ARMY CORPS OF ENGINEERS
HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET
DAVIS, CALIFORNIA 95616
(916) 756-1104

```

X   X XXXXXXXX XXXXX      X
X   X X      X      X    XX
X   X X      X      X      X
XXXXXXX XXXX  X      XXXXX X
X   X X      X      X      X
X   X X      X      X      X
X   X XXXXXXXX XXXXX      XXX

```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE, SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

OHIO VALLEY COAL
SLURRY DAM No. 2
CREST RAISING

36-HR PMF

36 HR
1

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
1	ID OHIO VALLEY COAL COMPANY SLURRY DAM NO.2
2	ID PMF ANALYSIS
3	ID 36 HR STORM PER MSHA (FROM PREVIOUS REPORT)
4	IT 60 0 0 300
5	IO 1
6	KK 10 RUNOFF FROM 479 AC WATERSHED
7	BA 0.75
8	IN 360
9	QI 0 40 248 2120 104 64 1
10	KK 15 ROUTE THROUGH SLURRY DAM NO2
11	KM
12	RS 1 ELEV 1130
13	SA 172 197
14	SE 1130 1140
15	SQ 0 9.3 23.3 44.5 61 125 296 550 896 1380
16	SE 1130 1131 1131.5 1132 1132.5 1133 1134 1135 1136 1137
17	ZZ

36 HR
2

FLOOD HYDROGRAPH PACKAGE (HEC-1)
JUN 1998
VERSION 4.1

RUN DATE 20MAY03 TIME 14:01:36

U.S. ARMY CORPS OF ENGINEERS
HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET
DAVIS, CALIFORNIA 95616
(916) 756-1104

OHIO VALLEY COAL COMPANY SLURRY DAM NO.2
PMF ANALYSIS
36 HR STORM PER MSHA (FROM PREVIOUS REPORT)

5 IO OUTPUT CONTROL VARIABLES

IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN 60 MINUTES IN COMPUTATION INTERVAL
IDATE 1 0 STARTING DATE
ITIME 0000 STARTING TIME
NQ 300 NUMBER OF HYDROGRAPH ORDINATES
NDDATE 13 0 ENDING DATE
NDTIME 1100 ENDING TIME
ICENT 19 CENTURY MARK

COMPUTATION INTERVAL 1.00 HOURS
TOTAL TIME BASE 299.00 HOURS

ENGLISH UNITS

DRAINAGE AREA SQUARE MILES
PRECIPITATION DEPTH INCHES
LENGTH, ELEVATION FEET
FLOW CUBIC FEET PER SECOND
STORAGE VOLUME ACRE-Feet
SURFACE AREA ACRES
TEMPERATURE DEGREES FAHRENHEIT

6 KK

10

RUNOFF FROM 479 AC WATERSHED

8 IN

TIME DATA FOR INPUT TIME SERIES

JXMIN 360 TIME INTERVAL IN MINUTES
JXDATE 1 0 STARTING DATE
JXTIME 0 STARTING TIME

SUBBASIN RUNOFF DATA

7 BA

SUBBASIN CHARACTERISTICS

TAREA .75 SUBBASIN AREA

HYDROGRAPH AT STATION 10

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	4		0300	76	1.	7		0600	151	1.	10		0900	226	1.
1		0100	2	7.	4		0400	77	1.	7		0700	152	1.	10		1000	227	1.
1		0200	3	13.	4		0500	78	1.	7		0800	153	1.	10		1100	228	1.
1		0300	4	20.	4		0600	79	1.	7		0900	154	1.	10		1200	229	1.

36 HR
3

1	0400	5	27.	*	4	0700	80	1.	*	7	1000	155	1.	*	10	1300	230	1.
1	0500	6	33.	*	4	0800	81	1.	*	7	1100	156	1.	*	10	1400	231	1.
1	0600	7	40.	*	4	0900	82	1.	*	7	1200	157	1.	*	10	1500	232	1.
1	0700	8	75.	*	4	1000	83	1.	*	7	1300	158	1.	*	10	1600	233	1.
1	0800	9	109.	*	4	1100	84	1.	*	7	1400	159	1.	*	10	1700	234	1.
1	0900	10	144.	*	4	1200	85	1.	*	7	1500	160	1.	*	10	1800	235	1.
1	1000	11	179.	*	4	1300	86	1.	*	7	1600	161	1.	*	10	1900	236	1.
1	1100	12	213.	*	4	1400	87	1.	*	7	1700	162	1.	*	10	2000	237	1.
1	1200	13	248.	*	4	1500	88	1.	*	7	1800	163	1.	*	10	2100	238	1.
1	1300	14	560.	*	4	1600	89	1.	*	7	1900	164	1.	*	10	2200	239	1.
1	1400	15	872.	*	4	1700	90	1.	*	7	2000	165	1.	*	10	2300	240	1.
1	1500	16	1184.	*	4	1800	91	1.	*	7	2100	166	1.	*	11	0000	241	1.
1	1600	17	1496.	*	4	1900	92	1.	*	7	2200	167	1.	*	11	0100	242	1.
1	1700	18	1808.	*	4	2000	93	1.	*	7	2300	168	1.	*	11	0200	243	1.
1	1800	19	2120.	*	4	2100	94	1.	*	8	0000	169	1.	*	11	0300	244	1.
1	1900	20	1784.	*	4	2200	95	1.	*	8	0100	170	1.	*	11	0400	245	1.
1	2000	21	1448.	*	4	2300	96	1.	*	8	0200	171	1.	*	11	0500	246	1.
1	2100	22	1112.	*	5	0000	97	1.	*	8	0300	172	1.	*	11	0600	247	1.
1	2200	23	776.	*	5	0100	98	1.	*	8	0400	173	1.	*	11	0700	248	1.
1	2300	24	440.	*	5	0200	99	1.	*	8	0500	174	1.	*	11	0800	249	1.
2	0000	25	104.	*	5	0300	100	1.	*	8	0600	175	1.	*	11	0900	250	1.
2	0100	26	97.	*	5	0400	101	1.	*	8	0700	176	1.	*	11	1000	251	1.
2	0200	27	91.	*	5	0500	102	1.	*	8	0800	177	1.	*	11	1100	252	1.
2	0300	28	84.	*	5	0600	103	1.	*	8	0900	178	1.	*	11	1200	253	1.
2	0400	29	77.	*	5	0700	104	1.	*	8	1000	179	1.	*	11	1300	254	1.
2	0500	30	71.	*	5	0800	105	1.	*	8	1100	180	1.	*	11	1400	255	1.
2	0600	31	64.	*	5	0900	106	1.	*	8	1200	181	1.	*	11	1500	256	1.
2	0700	32	54.	*	5	1000	107	1.	*	8	1300	182	1.	*	11	1600	257	1.
2	0800	33	43.	*	5	1100	108	1.	*	8	1400	183	1.	*	11	1700	258	1.
2	0900	34	33.	*	5	1200	109	1.	*	8	1500	184	1.	*	11	1800	259	1.
2	1000	35	22.	*	5	1300	110	1.	*	8	1600	185	1.	*	11	1900	260	1.
2	1100	36	11.	*	5	1400	111	1.	*	8	1700	186	1.	*	11	2000	261	1.
2	1200	37	1.	*	5	1500	112	1.	*	8	1800	187	1.	*	11	2100	262	1.
2	1300	38	1.	*	5	1600	113	1.	*	8	1900	188	1.	*	11	2200	263	1.
2	1400	39	1.	*	5	1700	114	1.	*	8	2000	189	1.	*	11	2300	264	1.
2	1500	40	1.	*	5	1800	115	1.	*	8	2100	190	1.	*	12	0000	265	1.
2	1600	41	1.	*	5	1900	116	1.	*	8	2200	191	1.	*	12	0100	266	1.
2	1700	42	1.	*	5	2000	117	1.	*	8	2300	192	1.	*	12	0200	267	1.
2	1800	43	1.	*	5	2100	118	1.	*	9	0000	193	1.	*	12	0300	268	1.
2	1900	44	1.	*	5	2200	119	1.	*	9	0100	194	1.	*	12	0400	269	1.
2	2000	45	1.	*	5	2300	120	1.	*	9	0200	195	1.	*	12	0500	270	1.
2	2100	46	1.	*	6	0000	121	1.	*	9	0300	196	1.	*	12	0600	271	1.
2	2200	47	1.	*	6	0100	122	1.	*	9	0400	197	1.	*	12	0700	272	1.
2	2300	48	1.	*	6	0200	123	1.	*	9	0500	198	1.	*	12	0800	273	1.
3	0000	49	1.	*	6	0300	124	1.	*	9	0600	199	1.	*	12	0900	274	1.
3	0100	50	1.	*	6	0400	125	1.	*	9	0700	200	1.	*	12	1000	275	1.
3	0200	51	1.	*	6	0500	126	1.	*	9	0800	201	1.	*	12	1100	276	1.
3	0300	52	1.	*	6	0600	127	1.	*	9	0900	202	1.	*	12	1200	277	1.
3	0400	53	1.	*	6	0700	128	1.	*	9	1000	203	1.	*	12	1300	278	1.
3	0500	54	1.	*	6	0800	129	1.	*	9	1100	204	1.	*	12	1400	279	1.
3	0600	55	1.	*	6	0900	130	1.	*	9	1200	205	1.	*	12	1500	280	1.
3	0700	56	1.	*	6	1000	131	1.	*	9	1300	206	1.	*	12	1600	281	1.
3	0800	57	1.	*	6	1100	132	1.	*	9	1400	207	1.	*	12	1700	282	1.
3	0900	58	1.	*	6	1200	133	1.	*	9	1500	208	1.	*	12	1800	283	1.
3	1000	59	1.	*	6	1300	134	1.	*	9	1600	209	1.	*	12	1900	284	1.
3	1100	60	1.	*	6	1400	135	1.	*	9	1700	210	1.	*	12	2000	285	1.
3	1200	61	1.	*	6	1500	136	1.	*	9	1800	211	1.	*	12	2100	286	1.
3	1300	62	1.	*	6	1600	137	1.	*	9	1900	212	1.	*	12	2200	287	1.
3	1400	63	1.	*	6	1700	138	1.	*	9	2000	213	1.	*	12	2300	288	1.
3	1500	64	1.	*	6	1800	139	1.	*	9	2100	214	1.	*	13	0000	289	1.
3	1600	65	1.	*	6	1900	140	1.	*	9	2200	215	1.	*	13	0100	290	1.
3	1700	66	1.	*	6	2000	141	1.	*	9	2300	216	1.	*	13	0200	291	1.
3	1800	67	1.	*	6	2100	142	1.	*	10	0000	217	1.	*	13	0300	292	1.
3	1900	68	1.	*	6	2200	143	1.	*	10	0100	218	1.	*	13	0400	293	1.
3	2000	69	1.	*	6	2300	144	1.	*	10	0200	219	1.	*	13	0500	294	1.
3	2100	70	1.	*	7	0000	145	1.	*	10	0300	220	1.	*	13	0600	295	1.
3	2200	71	1.	*	7	0100	146	1.	*	10	0400	221	1.	*	13	0700	296	1.
3	2300	72	1.	*	7	0200	147	1.	*	10	0500	222	1.	*	13	0800	297	1.
4	0000	73	1.	*	7	0300	148	1.	*	10	0600	223	1.	*	13	0900	298	1.
4	0100	74	1.	*	7	0400	149	1.	*	10	0700	224	1.	*	13	1000	299	1.
4	0200	75	1.	*	7	0500	150	1.	*	10	0800	225	1.	*	13	1100	300	1.

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	299.00-HR
2120.	18.00	(CFS) 1634.	631.	215.	53.
		(INCHES) 20.256	31.292	32.014	32.483
		(AC-FT) 810.	1252.	1281.	1299.

36 HR
4

CUMULATIVE AREA = .75 SQ MI

10712

10 KK

15

ROUTE THROUGH SLURRY DAM NO2

HYDROGRAPH ROUTING DATA

12 RS

STORAGE ROUTING

NSTPS 1 NUMBER OF SUBREACHES
ITYP ELEV TYPE OF INITIAL CONDITION
RSVRIC 1130.00 INITIAL CONDITION
X .00 WORKING R AND D COEFFICIENT

13 SA

AREA 172.0 197.0

14 SE

ELEVATION 1130.00 1140.00

15 SQ

DISCHARGE 0. 9. 23. 45. 61. 125. 296. 550. 896. 1380.

16 SE

ELEVATION 1130.00 1131.00 1131.50 1132.00 1132.50 1133.00 1134.00 1135.00 1136.00 1137.00

COMPUTED STORAGE-ELEVATION DATA

STORAGE .00 1843.59
ELEVATION 1130.00 1140.00

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

	STORAGE	OUTFLOW	ELEVATION	1130.00	1131.00	1131.50	1132.00	1132.50	1133.00	1134.00	1135.00	1136.00	1137.00
STORAGE	.00	173.21	260.73	348.85	437.59	526.94	707.50	890.54	1076.08	1264.14			
OUTFLOW	.00	9.30	23.30	44.50	61.00	125.00	296.00	550.00	896.00	1380.00			
ELEVATION	1130.00	1131.00	1131.50	1132.00	1132.50	1133.00	1134.00	1135.00	1136.00	1137.00			

STORAGE 1843.59
OUTFLOW 2832.00
ELEVATION 1140.00

HYDROGRAPH AT STATION

15

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1	0000	1	0.	.0	1130.0	*	5	0400	101	28.	280.4	1131.6	*	9	0800	201	9.	162.9	1130.9	
1	0100	2	0.	.3	1130.0	*	5	0500	102	27.	278.2	1131.6	*	9	0900	202	9.	162.2	1130.9	
1	0200	3	0.	1.1	1130.0	*	5	0600	103	27.	276.0	1131.6	*	9	1000	203	9.	161.6	1130.9	
1	0300	4	0.	2.5	1130.0	*	5	0700	104	26.	273.9	1131.6	*	9	1100	204	9.	161.0	1130.9	
1	0400	5	0.	4.4	1130.0	*	5	0800	105	26.	271.8	1131.6	*	9	1200	205	9.	160.3	1130.9	
1	0500	6	0.	6.8	1130.0	*	5	0900	106	25.	269.7	1131.6	*	9	1300	206	9.	159.7	1130.9	
1	0600	7	1.	9.8	1130.1	*	5	1000	107	25.	267.7	1131.5	*	9	1400	207	9.	159.1	1130.9	
1	0700	8	1.	14.5	1130.1	*	5	1100	108	25.	265.8	1131.5	*	9	1500	208	9.	158.5	1130.9	
1	0800	9	1.	22.0	1130.1	*	5	1200	109	24.	263.9	1131.5	*	9	1600	209	8.	157.9	1130.9	
1	0900	10	2.	32.4	1130.2	*	5	1300	110	24.	262.0	1131.5	*	9	1700	210	8.	157.2	1130.9	
1	1000	11	2.	45.5	1130.3	*	5	1400	111	23.	260.1	1131.5	*	9	1800	211	8.	156.6	1130.9	
1	1100	12	3.	61.5	1130.4	*	5	1500	112	23.	258.3	1131.5	*	9	1900	212	8.	156.0	1130.9	
1	1200	13	4.	80.3	1130.5	*	5	1600	113	23.	256.5	1131.5	*	9	2000	213	8.	155.4	1130.9	
1	1300	14	6.	113.2	1130.7	*	5	1700	114	22.	254.7	1131.5	*	9	2100	214	8.	154.8	1130.9	
1	1400	15	9.	171.8	1131.0	*	5	1800	115	22.	253.0	1131.5	*	9	2200	215	8.	154.2	1130.9	
1	1500	16	22.	255.4	1131.5	*	5	1900	116	22.	251.2	1131.4	*	9	2300	216	8.	153.6	1130.9	
1	1600	17	47.	363.3	1132.1	*	5	2000	117	22.	249.5	1131.4	*	10	0000	217	8.	153.0	1130.9	
1	1700	18	101.	493.7	1132.8	*	5	2100	118	21.	247.9	1131.4	*	10	0100	218	8.	152.4	1130.9	
1	1800	19	234.	642.1	1133.6	*	5	2200	119	21.	246.2	1131.4	*	10	0200	219	8.	151.8	1130.9	
1	1900	20	392.	777.5	1134.4	*	5	2300	120	21.	244.5	1131.4	*	10	0300	220	8.	151.2	1130.9	

36 HR
5

1	2000	21	526.	873.1	1134.9 *	6	0000	121	20.	242.9	1131.4 *	10	0400	221	8.	150.6	1130.9
1	2100	22	626.	931.3	1135.2 *	6	0100	122	20.	241.3	1131.4 *	10	0500	222	8.	150.1	1130.9
1	2200	23	672.	955.7	1135.4 *	6	0200	123	20.	239.8	1131.4 *	10	0600	223	8.	149.5	1130.9
1	2300	24	662.	950.8	1135.3 *	6	0300	124	20.	238.2	1131.4 *	10	0700	224	8.	148.9	1130.9
2	0000	25	607.	920.9	1135.2 *	6	0400	125	19.	236.7	1131.4 *	10	0800	225	8.	148.3	1130.9
2	0100	26	538.	881.9	1135.0 *	6	0500	126	19.	235.2	1131.4 *	10	0900	226	8.	147.7	1130.9
2	0200	27	490.	847.2	1134.8 *	6	0600	127	19.	233.7	1131.3 *	10	1000	227	8.	147.2	1130.8
2	0300	28	446.	815.7	1134.6 *	6	0700	128	19.	232.2	1131.3 *	10	1100	228	8.	146.6	1130.8
2	0400	29	407.	787.2	1134.4 *	6	0800	129	19.	230.7	1131.3 *	10	1200	229	8.	146.0	1130.8
2	0500	30	370.	761.2	1134.3 *	6	0900	130	18.	229.3	1131.3 *	10	1300	230	8.	145.5	1130.8
2	0600	31	338.	737.5	1134.2 *	6	1000	131	18.	227.9	1131.3 *	10	1400	231	8.	144.9	1130.8
2	0700	32	307.	715.7	1134.0 *	6	1100	132	18.	226.5	1131.3 *	10	1500	232	8.	144.3	1130.8
2	0800	33	284.	695.2	1133.9 *	6	1200	133	18.	225.1	1131.3 *	10	1600	233	8.	143.8	1130.8
2	0900	34	266.	675.6	1133.8 *	6	1300	134	17.	223.7	1131.3 *	10	1700	234	8.	143.2	1130.8
2	1000	35	248.	656.6	1133.7 *	6	1400	135	17.	222.4	1131.3 *	10	1800	235	8.	142.7	1130.8
2	1100	36	230.	638.3	1133.6 *	6	1500	136	17.	221.1	1131.3 *	10	1900	236	8.	142.1	1130.8
2	1200	37	214.	620.4	1133.5 *	6	1600	137	17.	219.7	1131.3 *	10	2000	237	8.	141.6	1130.8
2	1300	38	198.	603.5	1133.4 *	6	1700	138	17.	218.5	1131.3 *	10	2100	238	8.	141.0	1130.8
2	1400	39	183.	587.9	1133.3 *	6	1800	139	16.	217.2	1131.3 *	10	2200	239	8.	140.5	1130.8
2	1500	40	169.	573.4	1133.3 *	6	1900	140	16.	215.9	1131.2 *	10	2300	240	8.	140.0	1130.8
2	1600	41	156.	560.1	1133.2 *	6	2000	141	16.	214.7	1131.2 *	11	0000	241	7.	139.4	1130.8
2	1700	42	145.	547.7	1133.1 *	6	2100	142	16.	213.5	1131.2 *	11	0100	242	7.	138.9	1130.8
2	1800	43	134.	536.3	1133.1 *	6	2200	143	16.	212.2	1131.2 *	11	0200	243	7.	138.4	1130.8
2	1900	44	124.	525.7	1133.0 *	6	2300	144	15.	211.0	1131.2 *	11	0300	244	7.	137.8	1130.8
2	2000	45	117.	515.8	1132.9 *	7	0000	145	15.	209.9	1131.2 *	11	0400	245	7.	137.3	1130.8
2	2100	46	110.	506.5	1132.9 *	7	0100	146	15.	208.7	1131.2 *	11	0500	246	7.	136.8	1130.8
2	2200	47	104.	497.7	1132.8 *	7	0200	147	15.	207.6	1131.2 *	11	0600	247	7.	136.3	1130.8
2	2300	48	98.	489.5	1132.8 *	7	0300	148	15.	206.4	1131.2 *	11	0700	248	7.	135.7	1130.8
3	0000	49	93.	481.7	1132.7 *	7	0400	149	14.	205.3	1131.2 *	11	0800	249	7.	135.2	1130.8
3	0100	50	87.	474.3	1132.7 *	7	0500	150	14.	204.2	1131.2 *	11	0900	250	7.	134.7	1130.8
3	0200	51	82.	467.4	1132.7 *	7	0600	151	14.	203.1	1131.2 *	11	1000	251	7.	134.2	1130.8
3	0300	52	78.	460.9	1132.6 *	7	0700	152	14.	202.0	1131.2 *	11	1100	252	7.	133.7	1130.8
3	0400	53	73.	454.7	1132.6 *	7	0800	153	14.	201.0	1131.2 *	11	1200	253	7.	133.2	1130.8
3	0500	54	69.	448.9	1132.6 *	7	0900	154	14.	199.9	1131.2 *	11	1300	254	7.	132.7	1130.8
3	0600	55	65.	443.4	1132.5 *	7	1000	155	13.	198.9	1131.1 *	11	1400	255	7.	132.1	1130.8
3	0700	56	61.	438.3	1132.5 *	7	1100	156	13.	197.9	1131.1 *	11	1500	256	7.	131.6	1130.8
3	0800	57	60.	433.3	1132.5 *	7	1200	157	13.	196.9	1131.1 *	11	1600	257	7.	131.1	1130.8
3	0900	58	59.	428.5	1132.4 *	7	1300	158	13.	195.9	1131.1 *	11	1700	258	7.	130.6	1130.8
3	1000	59	58.	423.7	1132.4 *	7	1400	159	13.	194.9	1131.1 *	11	1800	259	7.	130.2	1130.8
3	1100	60	58.	419.0	1132.4 *	7	1500	160	13.	193.9	1131.1 *	11	1900	260	7.	129.7	1130.7
3	1200	61	57.	414.4	1132.4 *	7	1600	161	12.	193.0	1131.1 *	11	2000	261	7.	129.2	1130.7
3	1300	62	56.	409.8	1132.3 *	7	1700	162	12.	192.0	1131.1 *	11	2100	262	7.	128.7	1130.7
3	1400	63	55.	405.3	1132.3 *	7	1800	163	12.	191.1	1131.1 *	11	2200	263	7.	128.2	1130.7
3	1500	64	54.	400.9	1132.3 *	7	1900	164	12.	190.2	1131.1 *	11	2300	264	7.	127.7	1130.7
3	1600	65	53.	396.5	1132.3 *	7	2000	165	12.	189.3	1131.1 *	12	0000	265	7.	127.2	1130.7
3	1700	66	53.	392.2	1132.2 *	7	2100	166	12.	188.4	1131.1 *	12	0100	266	7.	126.7	1130.7
3	1800	67	52.	388.0	1132.2 *	7	2200	167	12.	187.5	1131.1 *	12	0200	267	7.	126.3	1130.7
3	1900	68	51.	383.8	1132.2 *	7	2300	168	11.	186.7	1131.1 *	12	0300	268	7.	125.8	1130.7
3	2000	69	50.	379.7	1132.2 *	8	0000	169	11.	185.8	1131.1 *	12	0400	269	7.	125.3	1130.7
3	2100	70	49.	375.7	1132.2 *	8	0100	170	11.	184.9	1131.1 *	12	0500	270	7.	124.8	1130.7
3	2200	71	49.	371.7	1132.1 *	8	0200	171	11.	184.1	1131.1 *	12	0600	271	7.	124.4	1130.7
3	2300	72	48.	367.8	1132.1 *	8	0300	172	11.	183.3	1131.1 *	12	0700	272	7.	123.9	1130.7
4	0000	73	47.	363.9	1132.1 *	8	0400	173	11.	182.5	1131.1 *	12	0800	273	7.	123.4	1130.7
4	0100	74	47.	360.1	1132.1 *	8	0500	174	11.	181.7	1131.0 *	12	0900	274	7.	123.0	1130.7
4	0200	75	46.	356.4	1132.0 *	8	0600	175	11.	180.9	1131.0 *	12	1000	275	7.	122.5	1130.7
4	0300	76	45.	352.7	1132.0 *	8	0700	176	10.	180.1	1131.0 *	12	1100	276	7.	122.0	1130.7
4	0400	77	45.	349.1	1132.0 *	8	0800	177	10.	179.3	1131.0 *	12	1200	277	7.	121.6	1130.7
4	0500	78	44.	345.5	1132.0 *	8	0900	178	10.	178.6	1131.0 *	12	1300	278	7.	121.1	1130.7
4	0600	79	43.	342.0	1132.0 *	8	1000	179	10.	177.8	1131.0 *	12	1400	279	6.	120.7	1130.7
4	0700	80	42.	338.6	1131.9 *	8	1100	180	10.	177.1	1131.0 *	12	1500	280	6.	120.2	1130.7
4	0800	81	41.	335.2	1131.9 *	8	1200	181	10.	176.3	1131.0 *	12	1600	281	6.	119.8	1130.7
4	0900	82	40.	331.9	1131.9 *	8	1300	182	10.	175.6	1131.0 *	12	1700	282	6.	119.3	1130.7
4	1000	83	40.	328.7	1131.9 *	8	1400	183	10.	174.9	1131.0 *	12	1800	283	6.	118.9	1130.7
4	1100	84	39.	325.6	1131.9 *	8	1500	184	9.	174.2	1131.0 *	12	1900	284	6.	118.4	1130.7
4	1200	85	38.	322.5	1131.9 *	8	1600	185	9.	173.5	1131.0 *	12	2000	285	6.	118.0	1130.7
4	1300	86	37.	319.4	1131.8 *	8	1700	186	9.	172.8	1131.0 *	12	2100	286	6.	117.6	1130.7
4	1400	87	37.	316.4	1131.8 *	8	1800	187	9.	172.1	1131.0 *	12	2200	287	6.	117.1	1130.7
4	1500	88	36.	313.5	1131.8 *	8	1900	188	9.	171.5	1131.0 *	12	2300	288	6.	116.7	1130.7
4	1600	89	35.	310.7	1131.8 *	8	2000	189	9.	170.8	1131.0 *	13	0000	289	6.	116.3	1130.7
4	1700	90	35.	307.8	1131.8 *	8	2100	190	9.	170.1	1131.0 *	13	0100	290	6.	115.8	1130.7
4	1800	91	34.	305.1	1131.8 *	8	2200	191	9.	169.4	1131.0 *	13	0200	291	6.	115.4	1130.7
4	1900	92	33.	302.4	1131.7 *	8	2300	192	9.	168.8	1131.0 *	13	0300	292	6.	115.0	1130.7
4	2000	93	33.	299.7	1131.7 *	9	0000	193	9.	168.1	1131.0 *	13	0400	293	6.	114.5	1130.7
4	2100	94	32.	297.2	1131.7 *	9	0100	194	9.	167.4	1131.0 *	13	0500	294	6.	114.1	1130.7
4	2200	95	31.	294.6	1131.7 *	9	0200	195	9.	166.8	1131.0 *	13	0600	295	6.	113.7	1130.7
4	2300	96	31.	292.1	1131.7 *	9	0300	196	9.	166.1	1131.0 *	13	0700	296	6.	113.3	1130.7
5	0000	97	30.	289.7	1131.7 *	9	0400	197	9.	165.5	1131.0 *	13	0800	297	6.	112.8	1130.7
5	0100	98	30.	287.3	1131.7 *	9	0500	198	9.	164.8	1131.0 *	13	0900	298	6.	112.4	1130.6
5	0200	99	29.	284.9	1131.6 *	9	0600										

5 0300 100 29. 282.6 1131.6 * 9 0700 200 9. 163.5 1130.9 * 13 1100 300 6. 111.6 1130.6

PEAK FLOW		TIME	MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	299.00-HR
672.	22.00	(CFS)	602.	362.	162.	48.
		(INCHES)	7.463	17.946	24.123	29.693
		(AC-FT)	299.	718.	965.	1188.

PEAK STORAGE		TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)		6-HR	24-HR	72-HR	299.00-HR
956.	22.00		917.	739.	516.	254.

PEAK STAGE		TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)		6-HR	24-HR	72-HR	299.00-HR
1135.35	22.00		1135.14	1134.17	1132.93	1131.45

CUMULATIVE AREA = 1.75 SQ MI

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	10	2120.	18.00	1634.	631.	215.	.75		
ROUTED TO	15	672.	22.00	602.	362.	162.	.75	1135.35	22.00

*** NORMAL END OF HEC-1 ***

36 HR
8

CLIENT OHIO VALLEY COAL
PROJECT SLURRY DAM #2
SUBJECT RAISING

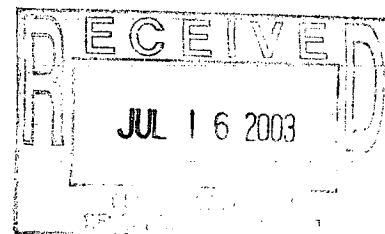
PROJECT NO. _____
SHEET NO. 11 OF 12
COMP. BY MFE DATE 5/20/03
CHECKED BY _____ DATE _____

THE DISCHARGE RATING CURVE IN THE "FINAL DESIGN REPORT, MODIFICATIONS TO SLURRY DAM No. 2, POWHATAN No. 6 MINE", MASON - DEVERTEUIL, FEB 1990, WILL BE USED. THE RATING CURVE WAS DEVELOPED FOR LOWER POOL CONDITIONS ~ 1047. THEREFORE, THIS WOULD BE SLIGHTLY CONSERVATIVE FOR POOL LEVELS ABOVE 1132.5 FT

ELEV	PRINCIPAL			PRINC RATING	EMERG SP/W	TOTAL RATING
	WEIR	ORIFICE	FULL			
1130	0		115	0		0
1130.5	3.8			3.8		3.8
1131.0	9.3	47		9.3		9.3
1131.5	23.3			23.3		23.3
1132.0	44.5	54		44.5		44.5
1132.5	73.5	61		61	0	61
1133.0	112.0	72	116	72	53	125
1134.0		77	119	77	219	296
1135.0		90		90	460	550
1136.0		94		94	802	896
1137.0		105		105	1275	1380

EMERGENCY SPILLWAY

Q	ENERGY	ELEV	ELEV	Q
0		1132.5	1133	53
150		1133.5	1134	219
289	2.0	1134.5	1135	460
836	3.6	1136.1	1136	802
			1137	1275
1568	5.1	1137.6		



CLIENT OHIO VALLEY COAL
PROJECT SLURRY DAM No. 2
SUBJECT CREST RAISING

PROJECT NO. _____
SHEET NO. 12 OF 12
COMP. BY MFZ DATE 5/20/03
CHECKED BY _____ DATE _____

STAGE - AREA

1130 172 ac
1140 197 ac

WATERSHED DA = 479

POOL 197 ac 0.31 sq. mi.

WOODS 186 ac CN = 73
PASTURE 96 ac CN = 79
282

WEIGHT CN = 75

**OHIO VALLEY COAL COMPANY
SLURRY DAM # 2
RAISED EMERGENCY SPILLWAY STRUCTURE**

Cavitation of Emergency Spillway Structure

Cavitation of spillway structures usually occurs under high head conditions and prolonged durations. The cavitation occurs when the underside of the flow nappe is not aerated. In the case of the emergency spillway at the Slurry Dam # 2, aeration of the nappe is expected since the structure is a vertical overfall structure. Air will be able to enter from the sides of the spillway just downstream of the lip of the concrete.

Cavitation is more common along the ogee crest type spillways, if the profile of the spillway is designed for low heads. As the ratio, of actual head to design head increases, the nappe will have a tendency to separate from the concrete surface, creating the zone of negative pressure where cavitation would occur. However, any slight disturbance will induce air into this cavity preventing the formation of cavitation.

Since the emergency spillway does not have a formed downstream face, cavitation of the structure is highly unlikely.



TRANSMITTAL

Date: May 22, 2003

To: Mr. David L. Bartsch, P.E.
Environmental Coordinator and Permit Administrator
The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Re: Slurry Dam No, 2 Embankment Raising

DLZ Project No.: 0321-3002.00

WE ARE TRANSMITTING HERewith THE FOLLOWING MATERIAL:

Date	Copies	Description
5/22/03	4	Letter with Design Drawings and Recommendations for Slurry Dam No. 2 Embankment Raising.
5/22/03	1	CD-Rom with electronic file of design drawings.

REMARKS:

Mr. Bartsch:

Enclosed please find the above referenced information needed for the Slurry Dam No. 2 Embankment Raising. If you have any questions, please let us know.

DLZ REPRESENTATIVE

P. Paul Painter

P. Paul Painter
Geologist

cc: File

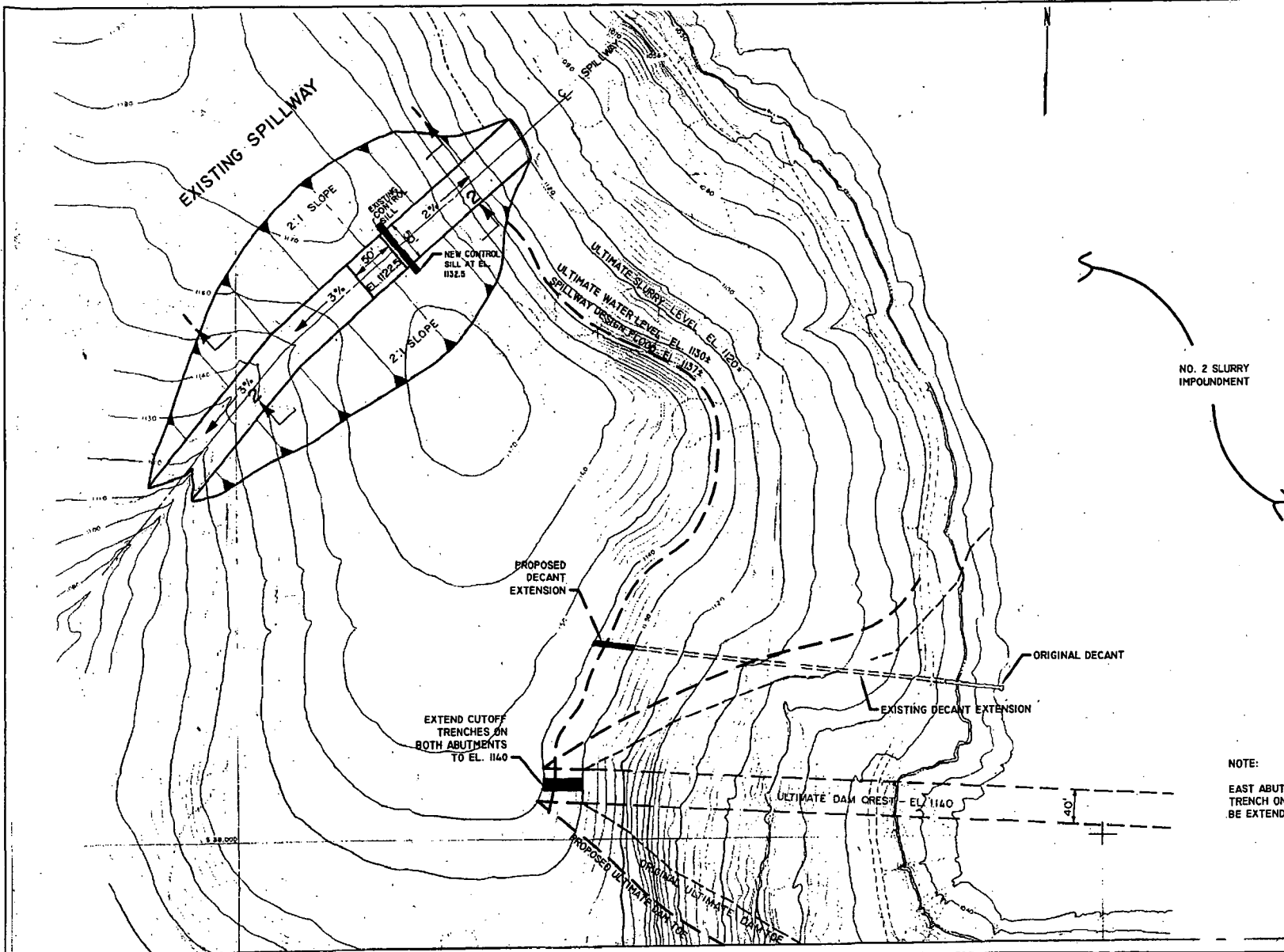
ENGINEERS • ARCHITECTS • SCIENTISTS • PLANNERS • SURVEYORS

6121 HUNTLEY ROAD

COLUMBUS, OHIO 43229-1003

PHONE: (614) 888-0040

FAX: (614) 888-6415



DLZ
Engineers • Architects • Planners
DLZ Ohio, Inc.
6121 Huxley Road • Columbus, Ohio 43229-1003
Phone (614) 853-0040 • Fax (614) 848-4712
www.dlzcovp.com

OHIO VALLEY COAL CO.

EMBANKMENT RAISING
NO. 2 SLURRY DAM

DESIGNED BY:	JOB NUMBER: 0201-000200
DRAWN BY: HJS	SCALE:
CHECKED BY:	DATE: MAY 21, 2003
APPROVED BY: AMH	REVISED:

GENERAL PLAN



TOVCC 1997B9



August 10, 1990

Mr. Ronald L. Keaton
District Manager
Mine Safety and Health Administration
5012 Mountaineer Mall
Morgantown, WV 26505

Dear Mr. Keaton:

We are in receipt of your letter of July 27, 1990 regarding the proposed modification of the No. 2 Slurry Impoundment (I.D. No. 12110H80025-03), located at the Powhatan No. 6 Mine (I.D. No. 33-01159). We respectfully submit the following responses:

Item 1a

A current mine map has been submitted that shows the location of the dam, reservoir, and all past and projected mining near the impoundment. Note: There is no mining planned in the area to the north of the current impoundment.

Item 1b

Aside from subsidence associated with longwall mining, there have been two known instances of unplanned subsidence over room and pillar workings. In each case, pillars were slightly under-designed (safety factor less than 1.4) coupled with excess water in high cover areas. These same factors are not present in the mine beneath the No. 2 dam and impoundment. Safety factors are no less than 1.5, the pillars were sized for the super-incumbent loads applied, and the area of the mine is relatively dry.

Normally, the floor at the No. 6 Mine is massive and is not susceptible to weathering from the presence of water. However, there are isolated instances of some soft bottom (up to about 1 ft in thickness) that is usually removed with the coal or, during latter operations, is removed with a scoop. Pillar punching into the bottom has never occurred at the mine.

56854 PLEASANT RIDGE ROAD • ALLEDONIA OHIO 43902 • (614) 926-1351

TOVCC 19980

Heaving also occurs periodically, with the upper 1 to 2 ft of bottom reacting to water or ground forces. However, this phenomenon only occurs when pillars are under loads where the safety factor is 1.3 or less. Pillars in the dam area have a safety factor of 1.5 or greater.

Item 1c

See report enclosed by L. R. Artler. The Holland strength formula was used to calculate pillar safety factors because all of our experience is based on Holland. The use of a more conservative method of analysis would not be beneficial since we have no experience with any other formulae.

Item 1d

As stated in item 1b above, the floor will be stable in areas where the pillar safety factor is greater than 1.4. Since the safety factors in the area are 1.5 or greater, floor instability is not expected to be a problem. The area will remain stable even with wet conditions.

Item 1e

As stated previously, the potential for subsidence is eliminated due to the pillar system safety factors currently in place and based upon our experience at the Powhatan No. 6 Mine. An analysis of the stability of the existing dam and of the working platform of the ultimate dam has been made. The final design report details that analysis and shows the structure to be stable. Furthermore, earthquake loading of the structure was considered, and the structure was again found to be stable.

Item 1f

Because the potential for subsidence is non-existent, and because the safety factors are relatively high, no measures are currently planned to monitor for subsidence. Weekly inspections of the structure as currently required by law and in practice at the mine will continue and will indicate any potential instability.

Item 2

The potential for inflow of water into the mine is non-existent. One must consider that coal refuse slurry underlies the water in the reservoir. The slurry is composed of fine coal and rock refuse, much of which is in the form of clays and claystones. This slurry will act as a relatively impermeable liner that will tend to reduce inflow of water into the mine. Rocks in the area are composed of clays that will swell and seal off any water from reaching the mine. If surface cracking would occur, the slurry will be forced into the cracks by the weight of the overlying slurry and water.

Inflow of surface water into the Powhatan No. 6 Mine caused by subsidence over room and pillar workings has never been documented. However, if surface water from the impoundment could enter the mine, it would produce pressure equivalent to the difference between the lowest point where it could enter the active works and the highest water level. The lowest point would be the new seals at the West Mains at an elevation of 710 ft (msl). The highest water level would be at an elevation of 1127 ft (msl) for a difference of 417 ft. The pressure created by 417 ft of water is equivalent to 182 psi. The bulkheads that form the seals are constructed of wet-laid concrete block with a minimum compressive strength of 700 psi, for a safety factor of over 3.8. Weekly inspections of these seals are made. In addition, at least one seal is equipped with a water trap that would permit the draining of any water from behind the seals. This water would be pumped outside from pumps located at the portal bottom.

Item 3

After fill placement operations begin on the working platform for the ultimate embankment, compaction tests will be performed based on a minimum of one test every 2000 cubic yards. The truck hauling refuse to the site carries approximately 60 cubic yards of material. Consequently, the minimum testing frequency will be one test every 30 truck loads.

Item 4

A "rock correction factor" is currently being applied in the equations used to determine the percent compaction of the fill. The factor is determined in the laboratory every two weeks or more often if it appears there is a change in the material.

Item 5

Concurrent with the ultimate embankment construction, we are planning to grade the downstream bench (el. 1000), the existing dam crest, and the downstream slope of the existing embankment. The bench and existing crest will be graded to provide positive drainage towards the abutments. The downstream slope of the existing embankment will be graded to return the slope to the original design.

Item 6

The seep on the existing bench near the right abutment does not appear to be a problem at this time. It is believed that the seep only appears in this location due to the inward slope of the bench. Prior investigations

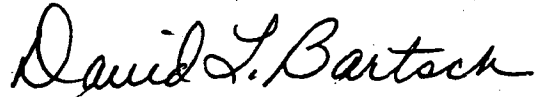
Page 4
Mr. Ronald L. Keaton
August 10, 1990

indicated that this water is only surface water flowing at the interface between the refuse and the topsoil that emerges at the bench. This seep is currently being monitored during weekly inspections. If it appears that the amount of seepage in this area is increasing with higher pool levels, a weir will be installed to monitor the seep. Regrading the existing downstream bench (el. 1000) may eliminate the seep. Monitoring for stability will continue on a weekly basis.

If you have any questions, please contact me at 614-926-1351 or Mr. Pete Nix at 614-888-0576. Your prompt consideration in this matter would be greatly appreciated.

Very truly yours,

THE OHIO VALLEY COAL COMPANY



David L. Bartsch, P. E.
Project Engineer

DLB:pm

cc: M. R. St. John
J. R. Forrelli
L. R. Artler
P. Nix
File

INTER-OFFICE CORRESPONDENCE

The Ohio Valley Coal Company

ALLEDONIA, OHIO 43902

DATE: August 16, 1990

TO: Mr. John R. Forrelli

SUBJECT: PILLAR SYSTEM SUPPORT IN THE VICINITY OF THE NO. 2 DAM

FROM: L. R. Artler *LRA*

Per your request, I have investigated the stability of the coal pillars beneath and adjacent to the modified No. 2 Dam and impoundment. But first a short summary of my background and thoughts used in this analysis may be in order.

The coal pillar design of the Powhatan No. 6 Mine utilizes primarily methodology proposed by Dr. C. T. Holland in consulting services performed in 1957 and 1973 for the North American Coal Corporation (NACCO) Central Division (the previous owner of the No. 6 Mine).

The Holland methods have been utilized for the past 15 years in mine design at this mine. An extensive research project conducted by NACCO engineering indicated coal pillars may become unstable at a design safety factor of 1.3, resulting in "squeezes", which in some cases result in surface subsidence. Because a squeeze at the mine level presents safety problems to the miners, jeopardizes equipment, and may severely impact mine production, all butt sections are specifically designed with a minimum safety of 1.3. In some cases where wet conditions are anticipated within a butt section, a higher safety factor (1.4) may be used in pillar design.

It must be pointed out that a pillar system is designed around the maximum overburden conditions; and, with the hilly surface terrain at the No. 6 Mine, the vast majority of the pillars in a pillar system have much higher safety factors simply because they are exposed to lower overburden forces.

All submain, main, or life-of-mine pillars are designed with a safety factory of 2.0. In no case in the past 20 years has an area of the Mine (or in other adjacent NACCO mines) suffered a "squeeze" where a 1.5 safety factory was utilized in pillar design.

All pillar systems beneath or adjacent to the No. 2 Dam and slurry impoundment offer stable overburden conditions and for the most part have stability factors of 2.0 or better.

The Holland strength formula is "middle-of-the-road", when conservation of method used in the analysis is considered (when comparing the Obert-Duvall equation to the Holland-Gaddy equation to the Bieniawski equation). Because of the author's experience and familiarity with Holland-Gaddy, this methodology was chosen for "back-calculation" of the pillar systems being evaluated. Years of background and

Page 2
J. R. Forrelli
August 16, 1990

experience have borne out that a stability factor in the 1.3 to 1.4 range is the "break point" for stable/unstable pillar conditions. The surface supported by pillar systems designed with a stability factor of 1.5 (or higher) will not subside.

The mine floor throughout the entire mine is strong (5,000 to 6,000 psi unconfined compressive strength) and is not subject to deterioration when in contact with water. The area of the mine adjacent and beneath the dam and impoundment were dry when initially mined. Since the submains have been sealed, no water has been observed behind the seals. For these reasons, I believe the coal pillars near the subject structures will not fail, even if water were present. I have seen no floor buckling at this mine, even in areas subject to high ground forces (i.e., near longwall mining areas). To the best of our knowledge, floor "heave" or buckling is not a mode of pillar failure at this mine.

LRA:pm

cc: D. L. Bartsch
File

1/11/91



XC LRA
YC+Fax P. Rix

January 7, 1991

Mr. Richard S. Rice
Director of Safety and Training
The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902


Dear Mr. Rice:

A review has been conducted of the proposed modification to the No. 2 Slurry Dam, I.D. No. 1211OH80025-03, located at the Powhatan No. 6 Mine, I.D. No. 33-01159. Before the review can be completed, the following information or clarifications are needed:

1. Details on the testing and any other information used as a basis of coal strength used in the pillar analysis.
2. Copies of the calculations which show the factors of safety of the pillars in the dam area.
3. The basis for the strength values of 5000 to 6000 psi, which are indicated for the floor.
4. The plan must address the examination of the West Mains Seals and procedures to ensure that the company's engineering department is made aware of water build-up or seepage at those seals.
5. The plan should address the engineering department's response to any water build-up or seepage at the West Mains Seals.

If you have any questions concerning this matter, please contact this office.

Sincerely,

6- 
Ronald L. Keaton
District Manager

* * * * *

SAFETY NOTE: "The ABC's of Safety: Always Be Careful."



February 12, 1991

Mr. Ronald L. Keaton
District Manager
Mine Safety and Health Administration
5012 Mountaineer Mall
Morgantown, West Virginia 26505

Re: Powhatan No. 6 Mine (ID No. 33-01159)
No. 2 Slurry Impoundment (ID No. 1211OH80025-03)

Attn: Mr. Peter D. Campbell

Dear Mr. Keaton:

The Ohio Valley Coal Company respectfully submits the enclosed information in response to your letter of January 7, 1991 regarding the proposed modification of the No. 2 Slurry Impoundment. The information enclosed addresses the five items in your letter as follows:

1. Items 1, 2, and 3 are addressed in the enclosed report by Mr. Larry Artler, Project Engineer with Ohio Valley. Please note: Information contained in Appendices D and E is proprietary and confidential. This information may not be released or used by anyone without the express, written consent of The Ohio Valley Coal Company.
2. Items 4 and 5 are addressed in the enclosed plan to evaluate the New West Seal area.

If you have any questions, please contact me. Since construction season will be here soon, your prompt consideration in this matter would be greatly appreciated.

Very truly yours,

THE OHIO VALLEY COAL COMPANY

David L. Bartsch, P. E.
Project Engineer

Enclosure

cc: M. R. St. John J. R. Forrelli
L. R. Artler A. E. Nix
J. Fredland File

56854 PLEASANT RIDGE ROAD • ALLEDONIA OHIO 43902 • (614) 926-1351

The Ohio Valley Coal Company

ALLEDONIA, OHIO 43902

DATE: February 8, 1991

TO: J. R. Forrelli

SUBJECT: OVERBURDEN STABILITY- NO. 2 SLURRY DAM

FROM: L. R. Artler



In reference to a letter from Mr. R. L. Keaton, MSHA District Manager, dated January 7, 1991, concerning coal pillar analysis beneath the No. 2 Slurry Dam, please find enclosed detailed answers to the points made.

Mr. Keaton asks for:

1. "Details on the testing and any other information used as a basis of coal strengths used in the pillar analysis."

As summarized in my letter of August 16, 1990, basic ground control principles were obtained from consultations with C. T. Holland. The studies were authorized by the former owner (i.e., North American Coal Corporation) and were conducted in both 1957 and 1973. These consultations considered:

- a) Coal specimen laboratory tests and extrapolation of laboratory data to seam size cubes (Appendix A - Section I).
- b) Formulation of data to predict average pillar strength (Appendix A - Section II).
- c) Calculation of loading imposed on the pillar as a result of overburden weight (Appendix A - Section III).
- d) Calculation of pillar safety factors (Appendix A - Section IV).

Utilizing these concepts, all underground coal pillars have been designed at this mine since 1975, including pillars in mains, submains, butt sections, longwall gates, and barrier pillars. (See Appendix D and Appendix E for excerpts from the Holland reports.

As stated in my letter of August 16, 1990, NACCO engineering undertook a pillar analysis study of butt section pillar systems in order to determine minimum stability factors. This study indicated the stable/unstable (i.e., "squeeze") break point

occurred in the 1.3 to 1.4 stability factor range. Thus, butt sections were designed with a stability factor in this range since 1975.

A point needs to be made that overall pillar stability factor analysis does not require all pillars in the system have a safety factor greater than one. Butt section analysis utilized to develop the "break-even" stability factor incorporated individual pillars with safety factors at or less than unity. Syd S. Peng in his soon to be published text book Surface Subsidence Engineering perhaps best explains this phenomena. "The tributary area loading concept states that the coal pillar must bear the whole overburden weight tributary to it. In practice, however, the stratigraphic nature of the coal measure overburden tends to offer a certain degree of self-support and thus the actual pillar loading in most cases is less than that estimated by the tributary area loading concept."

2. "Copies of the calculations which show the factors of safety of the pillars in the dam area."

Appendix B and Appendix C both show the coal pillars immediately beneath the dam structure, with Appendix B detailing the 5 Left Section and Appendix C the 4 Left Section. The individual maps detail the pillar numbering system and the spreadsheet details the individual calculations (as explained in Appendix A). Again, the pillar system stability factor is summarized for each pillar system.

3. "The basis for the strength values of 5000 to 6000 psi, which are indicated for the floor."

Over the past several years, the author has had experience designing mine coal pillars at both this mine and those in Powhatan Mines #1, #3, #4, #5, and #7. Unconfined compressive testing was performed by PD-NCB CONSULTANTS LIMITED to floor samples from both the Powhatan #4 and Powhatan #7 mines in the mid 1970's (in evaluating those reserves for longwall mining). The floor strength tested to be in the 4000 psi range. This material was quite water sensitive and frequently "heaved" when subjected to longwall related ground forces. At no time do I recollect floor failure associated with butt section "squeezes".

My "hands on" assessment of the mine floor at #6 Mine gives the impression that it is hard, tough, several feet thick, and is not weathering sensitive. My engineering judgment (when compared to the fireclay/claystone floor at Powhatan #4 and Powhatan #7 Mines) tells me the mine floor is certainly much more competent than that at the aforementioned mines.

Investigation into drillers logs of core holes drilled in the proximity of the dam describe limestone as being the material in the mine floor. The terms "limey shale", "sandy shale", "sandy limy shale" are used in describing the mine floor.

Dr. Syd S. Peng has indicated that material tests he performed on core samples of "limey shale" floor material from the Federal #2 Mine, four specimens from hole #3 ranged in value from 6424 to 17932 psi, with an average unconfined compressive strength of 12929 psi. The average of four cores in "limey shale" floor tested at 9975 psi. These tests were from mining conditions similar to those at the slurry dam site. The testing was done in 1975 for a tunnel boring project, in association with the USBM Spokane Research Center. The samples were from the floor beneath the Pittsburgh No. 8 Coal Seam.

W. J. Siplivy, staff geologist, who is a registered P.E. and a Certified Professional Geologist, has indicated that my assessment of the floor strength of 5000 to 6000 psi is probably low. His opinion is that the Peng number (i.e., 9000 psi) is more probably the typical floor strength at #6 Mine.

As can be seen from Appendices B and C, the percentage recovery of the coal pillars beneath the slurry dam is less than 50%. This does not include the massive 1,000 ft. by 1,000 ft. coal structure beneath the "heart" of the dam (see Reference Map for Appendices B and C, after Appendix C in the enclosures). Dr. Syd S. Peng stated in Surface Subsidence Engineering, "Under the prevailing mining conditions in the U.S., if only development mining is employed in room and pillar mining (i.e., no pillar extraction), the extraction ratio is usually less than 50% and generally no surface subsidence will occur."

LRA:pm

Enclosures

APPENDIX A

I. COAL CONSTANT FORMULA:

$$K = (SI)(d)^{.5}$$

where: K = COAL CONSTANT
SI = Unconfined Compressive Strength of a Lab Specimen (psi)
d = Edge Length of a Cubical Lab Specimen (inches)

For the No. 8 Seam (per C. T. Holland--APPENDIX D and APPENDIX E)

when: SI = 4330 psi when d = 3 inches
K = 7500

For a Seam Sized Cube (i.e. seam thickness of 78 inches)

$$\underline{K = 849 \text{ psi}}$$

II. COAL PILLAR STRENGTH FORMULA:

$$PS = (K)(L/T)^{.5}$$

where: PS = Pillar Strength (psi)
L = Least Pillar Dimension through Central Part of Pillar (Inches)
T = Pillar Thickness (Inches)
K = Strength of Seam Size Cube @ T Thickness (psi)

For Pillar No. 4 in the 4-Left Section

when: L = 42 ft
T = 6-1/2 ft

$$\underline{PS = 2159 \text{ psi}}$$

APPENDIX A (Con't)

III. OVERBURDEN LOAD ON THE PILLAR:

$$OL = (TA/PA)(D)(C)$$

where: OL = Overburden Load (psi)
TA = Original Pre-mine Area (sq ft)
PA = Pillar Area (sq ft)
D = Overburden Density (psi per ft of Overburden)
C = Overburden Thickness (ft)

For Pillar No. 4 in the 4-Left Section

TA = 3480 sq ft
PA = 1848 sq ft
D = 1 psi per ft of Overburden (per C. T. Holland - APPENDIX E)
C = 413 ft

$$\underline{\underline{OL = 778 \text{ psi}}}$$

IV. SAFETY FACTOR OF THE PILLAR:

$$SF = PS/OL$$

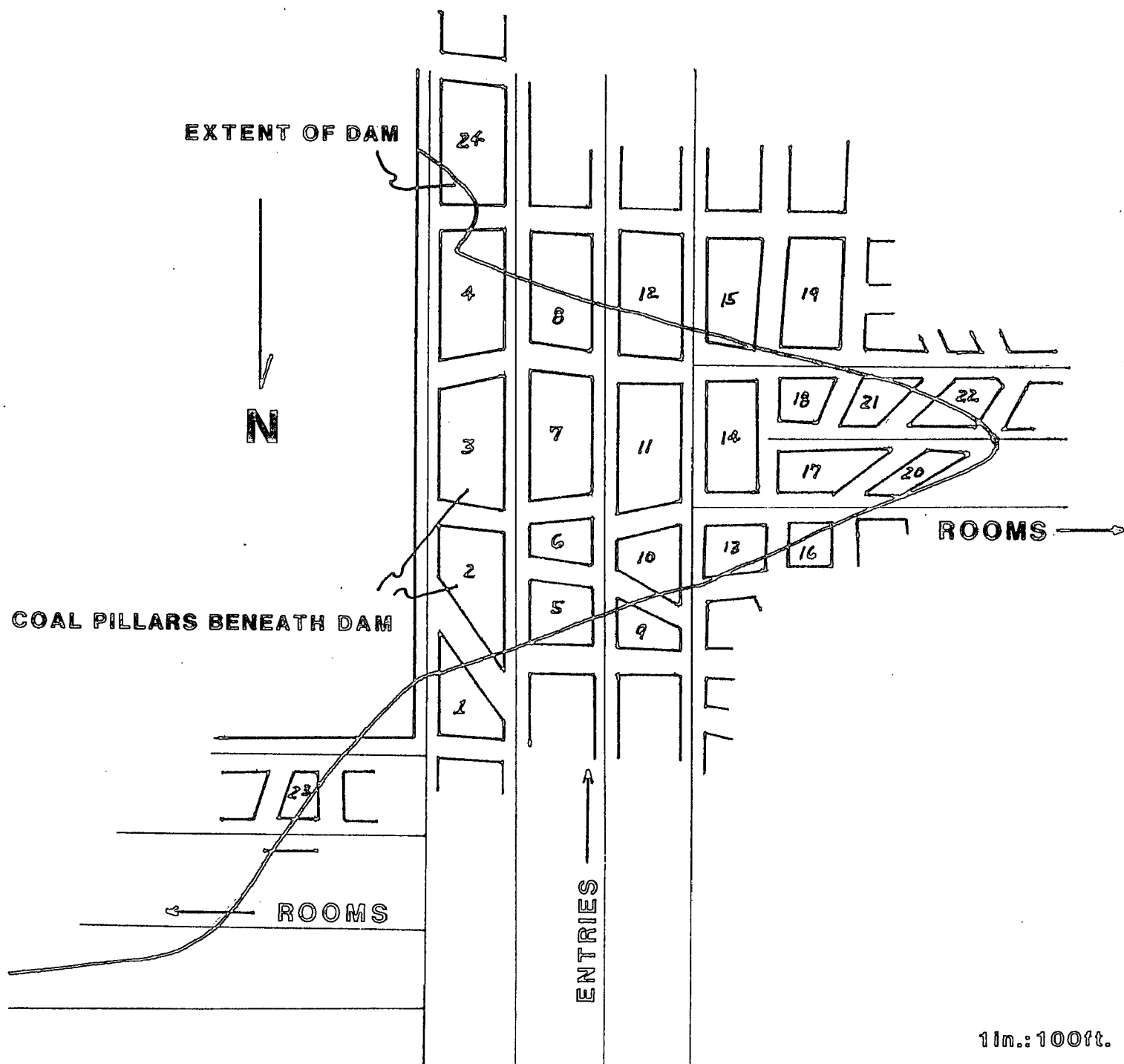
where: SF = Safety Factor of the Pillar
PS = Pillar Strength (psi)
OL = Overburden Load (psi)

For Pillar No. 4 in the 4-Left Section

$$\underline{\underline{SF = 2.8}}$$

APPENDIX B

Map Showing Coal Pillars
Beneath The No.2 Slurry Dam
In The 5 Left-Mains West Section



APPENDIX B

GENERALIZED SPREAD SHEET METHOD FOR DETERMINING PILLAR SYSTEM STABILITY FACTORS UTILIZING HOLLAND METHODOLOGY FOR PILLARS BENEATH NO.2 SLURRY DAM IN THE 5-LEFT 1 MAINS WEST SECTION

	ENTRY WIDTH (ft)	PILLAR WIDTH (ft)	LEAST DIMENSION (ft)	PILLAR AREA (sq ft)	ORIGINAL PRE-MINE AREA (sq ft)	COVER LOAD ON PILLAR (psi)	STRENGTH OF PILLAR (psi)	SAFETY FACTOR OF PILLAR
PILLAR 1	16.0	44.0						
	16.0	41.5	40.0	1826	3930	870	2107	2.4
	16.0	44.0						
PILLAR 2	16.0	68.5	44.0	3014	5640	756	2209	2.9
	16.0	44.0						
PILLAR 3	16.0	84.0	44.0	3696	6000	656	2209	3.4
	16.0	44.0						
PILLAR 4	16.0	87.0	44.0	3828	6180	652	2209	3.4
	16.0	44.0						
PILLAR 5	16.0	42.0	42.0	1848	3480	761	2159	2.8
	16.0	44.0						
PILLAR 6	16.0	27.0	27.0	1188	2580	877	1731	2.0
	16.0	44.0						
PILLAR 7	16.0	88.0	44.0	3872	6240	651	2209	3.4
	16.0	44.0						
PILLAR 8	16.0	79.0	44.0	3476	5700	662	2209	3.3
	16.0	44.0						
PILLAR 9	16.0	27.0	27.0	1188	2580	877	1731	2.0
	16.0	44.0						
PILLAR 10	16.0	36.0	36.0	1584	3120	796	1998	2.5
	16.0	44.0						
PILLAR 11	16.0	86.0	44.0	3784	6120	653	2209	3.4
	16.0	44.0						
PILLAR 12	16.0	86.0	44.0	3784	6120	653	2209	3.4
	18.0	45.0						
PILLAR 13	20.0	34.5	34.5	1553	3508	913	1958	2.1
	18.0	32.0						
PILLAR 14	20.0	80.0	32.0	2560	5000	789	1884	2.4
	18.0	32.0						
PILLAR 15	20.0	80.0	32.0	2560	5000	789	1884	2.4
	20.0	23.0						
PILLAR 16	20.0	30.0	23.0	690	2150	1259	1597	1.3
	20.0	30.0						
PILLAR 17	20.0	57.0	30.0	1710	3750	886	1824	2.1

APPENDIX B

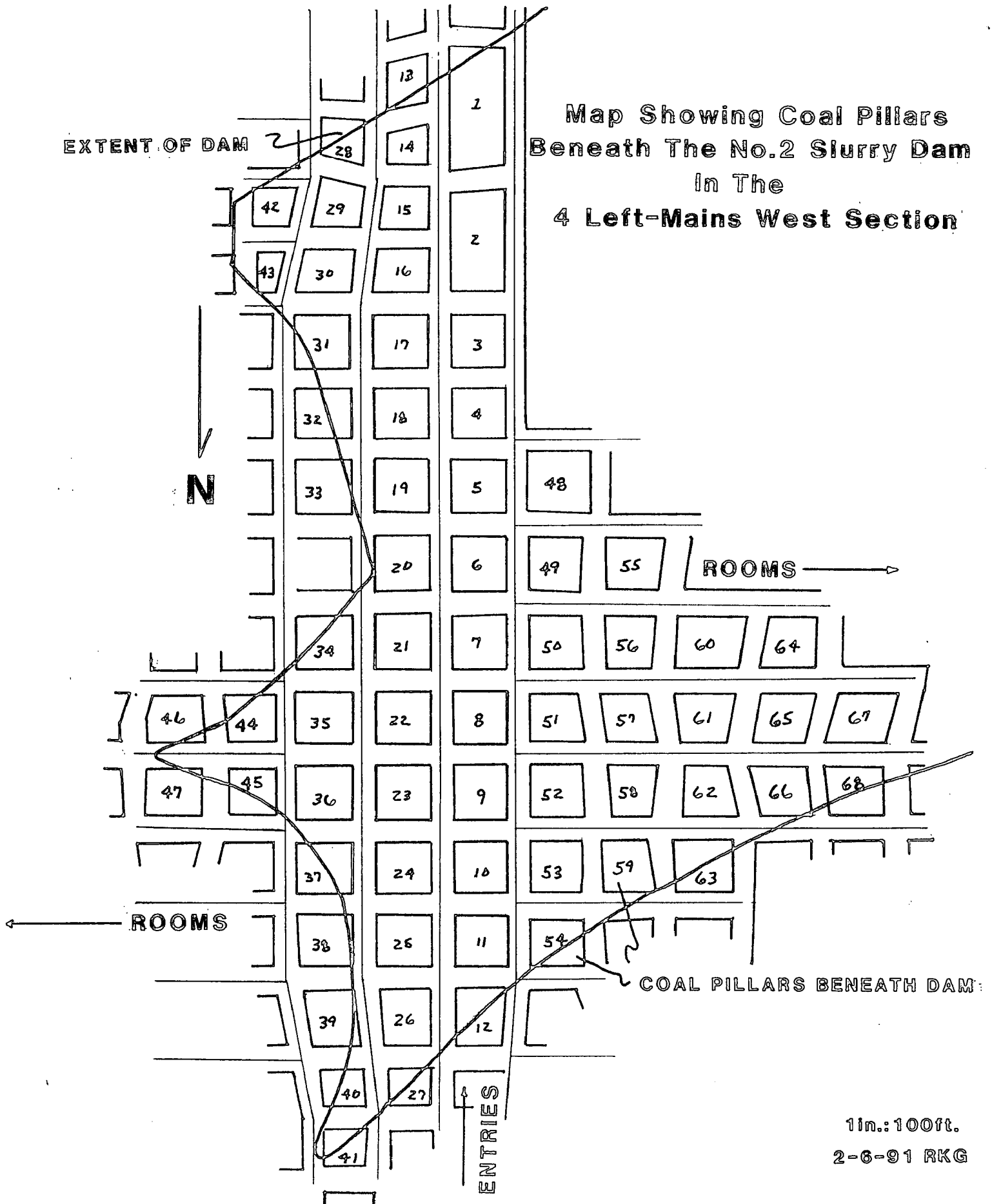
STABILITY FACTOR SUMMARY:

	20.0	31.0						
PILLAR 18	20.0	33.5	31.0	1039	2219	863	1854	2.1
	20.0	33.0						
PILLAR 19	20.0	76.0	33.0	2508	5088	820	1913	2.3
	20.0	28.0						
PILLAR 20	20.0	25.0	15.0	700	2668	1482	1290	0.9
	20.0	31.0						
PILLAR 21	20.0	42.0	30.0	1302	2780	863	1824	2.1
	20.0	31.0						
PILLAR 22	20.0	37.5	31.0	1163	2984	1037	1854	1.8
	20.0	33.0						
PILLAR 23	20.0	22.0	22.0	726	2226	1239	1562	1.3
	16.0	44.0						
PILLAR 24	16.0	86.0	44.0	3784.0	6120.0	653.4	2209.4	3.4

SUMMARY OF ALL PILLARS:

ORIGINAL AREA=	101083 sq ft
AREA OF PILLARS=	53383 sq ft
PERCENT RECOVERY=	47.2 %
COVER=	404 ft
OVERBURDEN LOAD=	765 psi
PILLAR STRENGTH=	2059 psi
STABILITY FACTOR OF THE PILLAR SYSTEM=	<u>2.69</u>

APPENDIX C



APPENDIX C

GENERALIZED SPREAD SHEET METHOD FOR DETERMINING PILLAR SYSTEM STABILITY FACTORS UTILIZING HOLLAND METHODOLOGY FOR PILLARS BENEATH NO. 2 SLURRY DAM IN THE 4-LEFT 1 MAINS WEST SECTION

	ENTRY WIDTH (ft)	PILLAR WIDTH (ft)	LEAST DIMENSION (ft)	PILLAR AREA (sq ft)	ORIGINAL PRE-MINE AREA (sq ft)	COVER LOAD ON PILLAR (psi)	STRENGTH OF PILLAR (psi)	SAFETY FACTOR OF PILLAR
PILLAR 1	16.0	44.0						
	16.0	99.0	44.0	4356	6900	654	2209	3.4
	16.0	44.0						
PILLAR 2	16.0	80.0	44.0	3520	5760	676	2209	3.3
	16.0	44.0						
PILLAR 3	16.0	44.0	44.0	1936	3600	768	2209	2.9
	16.0	44.0						
PILLAR 4	16.0	42.0	42.0	1848	3480	778	2159	2.8
	16.0	44.0						
PILLAR 5	16.0	44.0	44.0	1936	3600	768	2209	2.9
	16.0	44.0						
PILLAR 6	16.0	45.0	44.0	1980	3660	763	2209	2.9
	16.0	44.0						
PILLAR 7	16.0	44.0	44.0	1936	3600	768	2209	2.9
	16.0	44.0						
PILLAR 8	16.0	41.0	41.0	1804	3420	783	2133	2.7
	16.0	44.0						
PILLAR 9	16.0	45.0	44.0	1980	3660	763	2209	2.9
	16.0	44.0						
PILLAR 10	16.0	44.0	44.0	1936	3600	768	2209	2.9
	16.0	44.0						
PILLAR 11	16.0	45.0	44.0	1980	3660	763	2209	2.9
	16.0	41.0						
PILLAR 12	16.0	46.0	41.0	1886	3534	774	2133	2.8
	16.0	42.0						
PILLAR 13	16.0	41.8	41.1	1754	3364	792	2136	2.7
	16.0	34.0						
PILLAR 14	16.0	32.0	32.0	1088	2400	911	1884	2.1
	16.0	36.0						
PILLAR 15	16.0	33.0	33.0	1188	2548	886	1913	2.2
	16.0	42.0						
PILLAR 16	16.0	34.0	34.0	1428	2900	839	1942	2.3
	16.0	44.0						
PILLAR 17	16.0	43.0	43.0	1892	3540	773	2184	2.8

APPENDIX C

STABILITY FACTOR SUMMARY:

	16.0	44.0						
PILLAR 18	16.0	41.0	41.0	1804	3420	783	2133	2.7
	16.0	44.0						
PILLAR 19	16.0	44.0	44.0	1936	3600	768	2209	2.9
	16.0	44.0						
PILLAR 20	16.0	45.0	44.0	1980	3660	763	2209	2.9
	16.0	44.0						
PILLAR 21	16.0	44.0	44.0	1936	3600	768	2209	2.9
	16.0	44.0						
PILLAR 22	16.0	42.0	42.0	1848	3480	778	2159	2.8
	16.0	44.0						
PILLAR 23	16.0	45.0	44.0	1980	3660	763	2209	2.9
	16.0	44.0						
PILLAR 24	16.0	44.0	44.0	1936	3600	768	2209	2.9
	16.0	44.0						
PILLAR 25	16.0	44.0	44.0	1936	3600	768	2209	2.9
	16.0	42.0						
PILLAR 26	16.0	46.0	42.0	1932	3596	769	2159	2.8
	16.0	33.0						
PILLAR 27	16.0	32.0	32.0	1056	2352	920	1884	2.0
	16.0	34.0						
PILLAR 28	16.0	34.0	34.0	1156	2500	893	1942	2.2
	16.0	36.0						
PILLAR 29	16.0	37.0	36.0	1332	2756	855	1998	2.3
	16.0	43.0						
PILLAR 30	16.0	34.0	34.0	1462	2950	833	1942	2.3
	16.0	44.0						
PILLAR 31	16.0	43.0	43.0	1892	3540	773	2184	2.8
	16.0	44.0						
PILLAR 32	16.0	40.0	40.0	1760	3360	788	2107	2.7
	16.0	44.0						
PILLAR 33	16.0	45.0	44.0	1980	3660	763	2209	2.9
	16.0	44.0						
PILLAR 34	16.0	44.0	44.0	1936	3600	768	2209	2.9
	16.0	44.0						
PILLAR 35	16.0	41.0	41.0	1804	3420	783	2133	2.7
	16.0	44.0						
PILLAR 36	16.0	45.0	44.0	1980	3660	763	2209	2.9
	16.0	45.0						
PILLAR 37	16.0	44.0	44.0	1980	3660	763	2209	2.9
	16.0	44.0						
PILLAR 38	16.0	45.0	44.0	1980	3660	763	2209	2.9
	16.0	42.0						
PILLAR 39	16.0	46.0	42.0	1932	3596	769	2159	2.8

APPENDIX C

STABILITY FACTOR SUMMARY:

	16.0	36.0						
PILLAR 40	16.0	32.0	32.0	1152	2496	895	1884	2.1
	16.0	34.0						
PILLAR 41	16.0	32.0	32.0	1088	2400	911	1884	2.1
	18.0	27.0						
PILLAR 42	20.0	29.0	27.0	783	2205	1163	1731	1.5
	18.0	16.0						
PILLAR 43	20.0	30.0	16.0	480	1650	1420	1332	0.9
	18.0	37.0						
PILLAR 44	20.0	38.0	37.0	1406	3190	937	2026	2.2
	18.0	40.0						
PILLAR 45	20.0	40.0	40.0	1600	3480	898	2107	2.3
	20.0	40.0						
PILLAR 46	20.0	39.0	39.0	1560	3540	937	2080	2.2
	20.0	43.0						
PILLAR 47	20.0	40.0	40.0	1720	3780	908	2107	2.3
	18.0	47.0						
PILLAR 48	20.0	45.0	45.0	2115	4225	825	2234	2.7
	18.0	40.0						
PILLAR 49	20.0	40.0	40.0	1600	3480	898	2107	2.3
	18.0	43.0						
PILLAR 50	20.0	40.0	40.0	1720	3660	879	2107	2.4
	18.0	40.0						
PILLAR 51	20.0	37.0	37.0	1480	3306	923	2026	2.2
	18.0	42.0						
PILLAR 52	20.0	40.0	40.0	1680	3600	885	2107	2.4
	18.0	40.0						
PILLAR 53	20.0	43.0	40.0	1720	3654	877	2107	2.4
	18.0	40.0						
PILLAR 54	20.0	38.0	38.0	1520	3364	914	2053	2.2
	20.0	43.0						
PILLAR 55	20.0	40.0	40.0	1720	3780	908	2107	2.3
	20.0	34.0						
PILLAR 56	20.0	42.0	34.0	1428	3348	968	1942	2.0
	20.0	35.0						
PILLAR 57	20.0	36.0	35.0	1260	3080	1010	1971	2.0
	20.0	33.0						
PILLAR 58	20.0	40.0	33.0	1320	3180	995	1913	1.9
	20.0	35.0						
PILLAR 59	20.0	42.0	35.0	1470	3410	958	1971	2.1
	20.0	39.0						
PILLAR 60	20.0	40.0	39.0	1560	3540	937	2080	2.2
	20.0	42.0						
PILLAR 61	20.0	35.0	35.0	1470	3410	958	1971	2.1

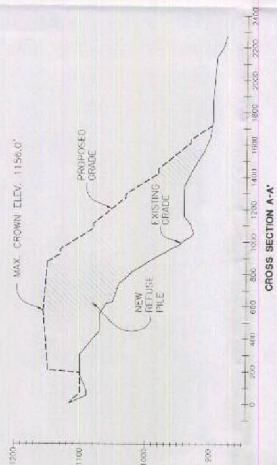
APPENDIX C

STABILITY FACTOR SUMMARY:

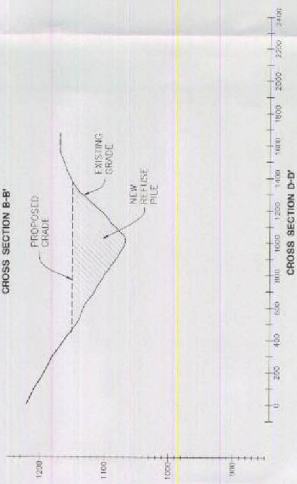
	20.0	40.0						
PILLAR 62	20.0	40.0	40.0	1600	3600	929	2107	2.3
	20.0	43.0						
PILLAR 63	20.0	42.0	42.0	1806	3906	893	2159	2.4
	20.0	38.0						
PILLAR 64	20.0	40.0	38.0	1520	3480	946	2053	2.2
	20.0	40.0						
PILLAR 65	20.0	39.0	39.0	1560	3540	937	2080	2.2
	20.0	38.0						
PILLAR 66	20.0	39.0	38.0	1482	3422	954	2053	2.2
	20.0	43.0						
PILLAR 67	20.0	39.0	39.0	1677	3717	915	2080	2.3
	20.0	38.0						
PILLAR 68	20.0	39.0	38.0	1482	3422	954	2053	2.2

SUMMARY OF ALL PILLARS:

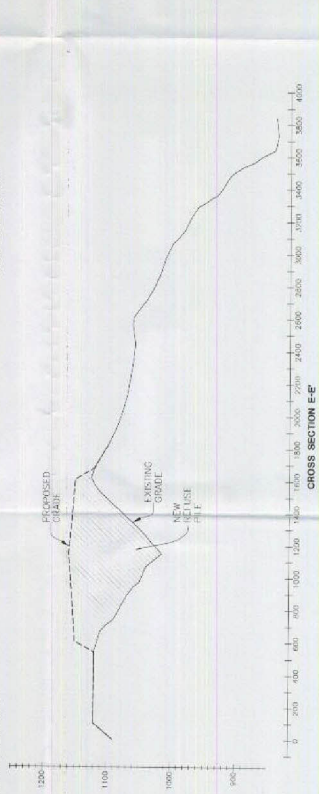
ORIGINAL AREA=	235021	sq ft
AREA OF PILLARS=	116965	sq ft
PERCENT RECOVERY=	50.2	%
COVER=	413	ft.
OVERBURDEN LOAD=	830	psi
PILLAR STRENGTH=	2117	psi
STABILITY FACTOR OF THE PILLAR SYTEM=	2.55	



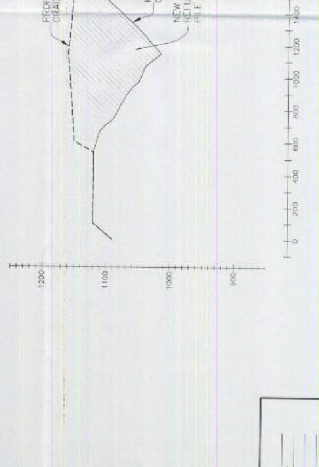
CROSS SECTION B-B'



CROSS SECTION D-D'



CROSS SECTION E-E'



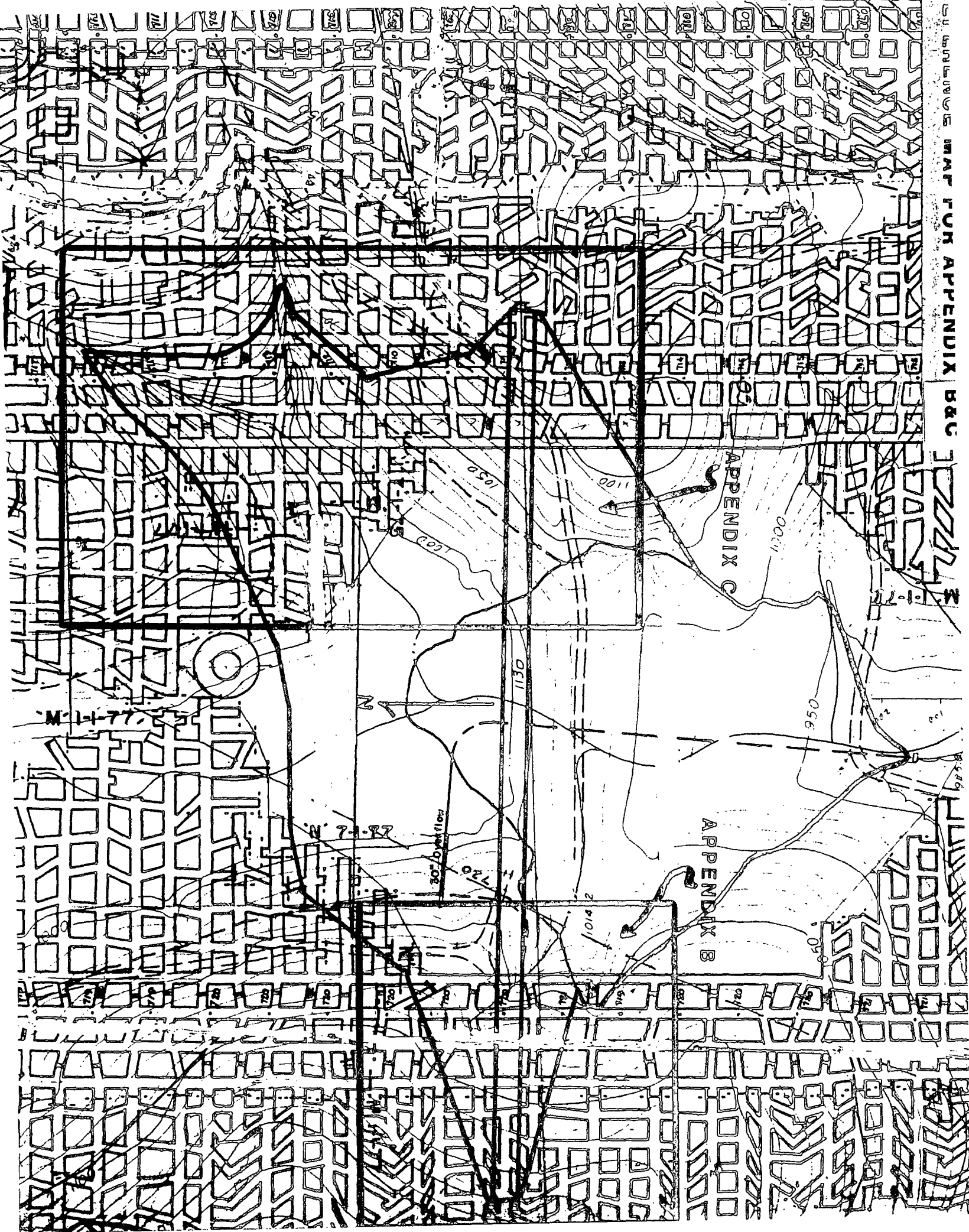
THE OTO FALLS COAL COMPANY
56254 PLEASANT RIDGE ROAD
WILLIAMS, OHIO 43080

CROSS-SECTIONS
FOR THE RAIL COAL AND/OR DISPOSAL FACILITY

DATE: 12/20/01
DRAWN BY: J. L. HARRIS
CHECKED BY: J. L. HARRIS
SCALE: AS SHOWN



OPERATOR



APPENDIX D
EXCERPTS FROM THE 1973 REPORT
TO
THE NORTH AMERICAN COAL CORPORATION
BY
C. T. HOLLAND

NOTE: The information contained in this section is proprietary and confidential. This information may not be released or used by anyone without the express, written consent of The Ohio Valley Coal Company

Of paramount importance to this study is the strength of the Pittsburgh Coal in pillars of the sizes likely to be used in this mine. This can be estimated, or gotten, if samples are available of the coal for tests ranging from about three inches, up to four, five or six inches, in size. Several sets of samples have been taken in this general vicinity averaging about three inches in size. In the Martins Ferry-St. Clairsville area, the strength of the Pittsburgh Coal averaged about 6,400 pounds per square inch in compression when tested in three inch cubes.

In a sample taken near Moundsville it averaged about 3,900 pounds per square inch in 3" cubes. Near Triadelphia, W. Va. it averaged 4,300 pounds per square inch, in three-inch cubes and at Glen Easton, W. Va., it averaged about 3,200 pounds per square inch when tested in three-inch cubes. At Powhatan Point, the average of several three inch samples, cubes tested in compression, was 4,330 pounds per square inch. No samples were taken in Quarto No. 7 or No. 4 mines but my impression is that this coal would average around 4,000 pounds per square inch there when tested in a three-inch cube. Consequently, for this study we have taken the value of the strength of this coal in a three-inch cube, in this area to be about 4,330 pounds per square inch.

Long experience in testing coal and using these tests indicates that it has a fairly high probable error when a substantial number of 3-inch cubical samples are tested, so we should regard this value as a variable, having a probable error of somewhere between plus or minus 600 pounds per square inch. Since the pillars to be used in this mine will be fairly large, except those that it is proposed to leave as stumps, 4,330 pounds per square inch would seem to be quite satisfactory as an estimate of the strength of the Pittsburgh Coal when tested in three-inch cubes. The larger the pillar is the more nearly is this value likely to be as averaged.

The smaller the pillar is, the more likely it is to be greater or lesser than this amount.

The coal also shows a decided size effect insofar as strength and sample size is concerned. The smaller the sample, the stronger the coal, the larger the sample the weaker the coal in pounds per square inch. The strength at the bed thickness of the coal here is going to be considerably less than 4,330 pounds per square inch. Extensive testing by many people has indicated that the strength of coal varies inversely as the square root of the edge dimension of the cube in which it is tested. On this basis, an investigation of the strength here leads to the following conclusion: The Pittsburgh Coal when tested in three-inch cubes has a strength of 4,330 pounds per square inch; when tested in 42-inch cubes it has a strength of 1,158 pounds per square inch; when tested in 48-inch cubes it has a strength of ¹⁰⁸³~~1,033~~ pounds per square inch; when tested in 60-inch cubes it has a strength of 968 pounds per square inch, and when tested in 72-inch cubes it has a strength of 884 pounds per square inch. All the above results apply to compressive strength.

Extensive testing by several different investigators has indicated that the strength of model pillars tends to increase as the square root of the least width divided by the thickness increases. This seems to be a fairly accurate statement of the strength of coal in pillars. However, there is a limitation to this and this is around a least width divided by thickness of 9 to 12, the strength of the coal tends to increase very rapidly, and the coal at an L/T* of 12 becomes essentially uncrushable by ordinary means. Therefore, pillars that are more than 12 to 15 times their

*L = least width
T = Thickness

APPENDIX E
EXCERPTS FROM THE 1957 REPORT
TO
THE NORTH AMERICAN COAL CORPORATION
BY
C. T. HOLLAND

NOTE: The information contained in this section is proprietary and confidential. This information may not be released or used by anyone without the express, written consent of The Ohio Valley Coal Company

are estimated by planimetric measurement to be about 30 percent and 39 percent. (See Fig. 2 for section measured) Under these conditions the strength of a cube of this coal having edge dimensions equal to the bed thickness must have been less than 1100 to 1170 psi.

Since the pillars in these squeeze areas stood for about 2 1/2 months before failure occurred, it seems probably that the strength of a cube having the thickness of the seam as edge dimensions would be close to 1100 psi. A value of 1000 psi perhaps would be a good conservative estimate for this value.

Laboratory investigations of twenty-nine 3" cube specimens of coal from Powhatan No. 1 Mine indicated a strength of 4337 psi with a probable error of 106 psi. From these laboratory studies, it is estimated that the ultimate strength of a 7 1/2 foot cube of this coal would be near 800 psi.

In view of these values it would appear to be safe to take the ultimate strength of this coal as being about 850 psi for a 7 1/2 foot cube. On this basis then coal pillars having least widths as shown should develop approximate average strength as indicated in Table I.

LOAD ON PILLARS

The average weight of the overburden may be estimated to be 1 pound per square inch per foot of overburden thickness. Therefore, the average load on pillars for various percentages of extraction at depth between 300 and 800 feet is shown in Table II.

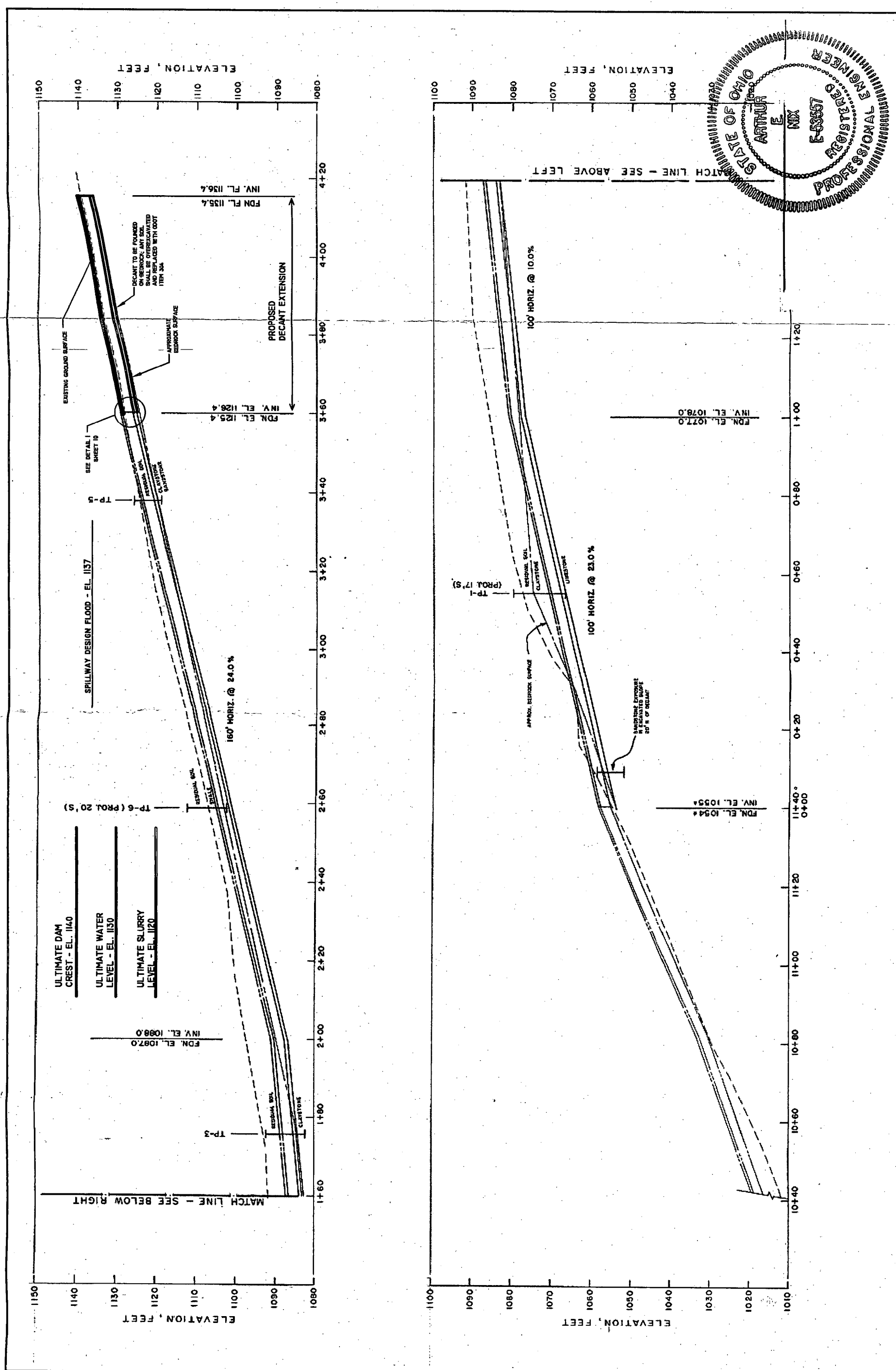
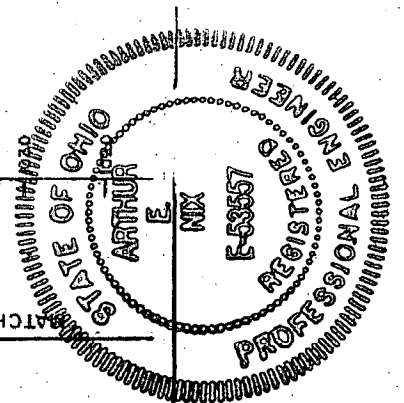
Considering the information in Table I and Table II and Fig. 4 and Fig. 5 plus a margin of safety, time pillars will have to stand, as well as other factors leads to the construction of Table III. In this table are given the necessary dimensions for laying out a section under various cover thicknesses

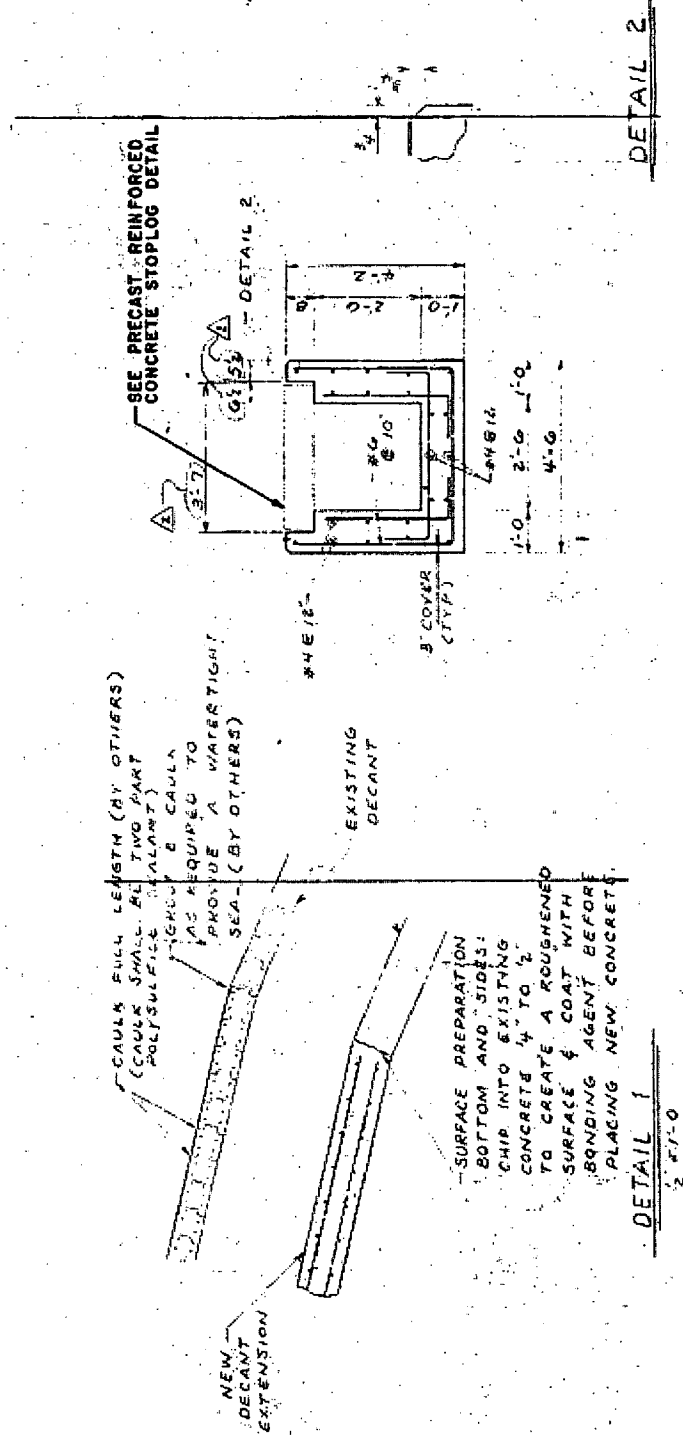
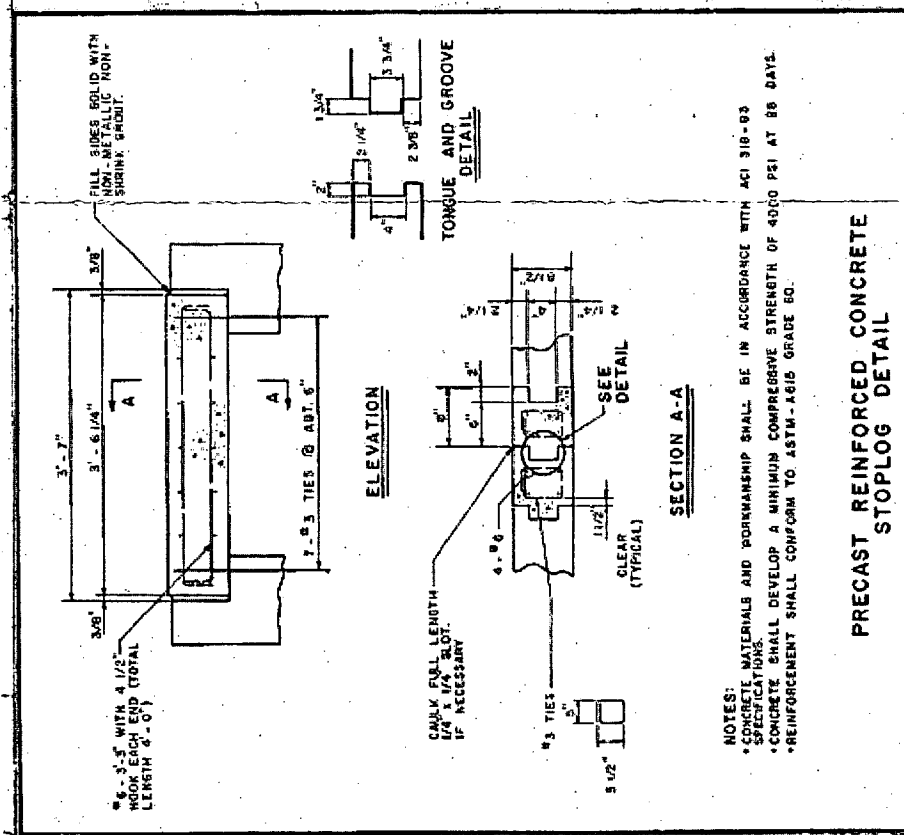
NEW WEST SEAL EVALUATIONS

The following procedures shall be followed by all persons making weekly examinations of the New West Main Seals located on the west side of the New Main entries:

1. All persons making examinations of the New West Main Seals will examine each seal for signs of cracking, crushing, water seepage, or other indications that water may be accumulating behind the seal.
2. All persons making examinations of the New West Main Seals will examine the proximate seal area for signs of water accumulations. Examiners will especially note any abrupt increase in water flow or in the depth of any accumulated water.
3. Examiners shall enter the information described above in a book kept at the mine and shall notify the mine foreman that such conditions exist.
4. The mine foreman will notify the engineering manager that such conditions exist. The engineering manager will notify MSHA's dam safety personnel.
5. The engineering manager or the safety director will submit to MSHA a plan to mitigate the conditions found at the seals.
6. All persons who examine the New West Main Seals will be trained in the procedures described above.

ROCK CORE COMPRESSIVE STRENGTH TEST RESULTS			
BORING NO. N91-6			
OHIO VALLEY COAL			
JOB NO. 91046			
Sample No.	Depth (ft.)	Unit Wt. (pcf)	Compressive Strength (psi)
1	453.6 - 453.9	165.9	5268
2	454.0 - 454.3	170.9	12590
3	455.0 - 455.3	161.6	9918
4	455.3 - 459.6	163.0	9752
5	456.8 - 457.1	161.0	6903
6	457.3 - 457.6	163.3	6220
7	458.0 - 458.3	161.4	7585
8	464.3 - 464.7	160.6	5699

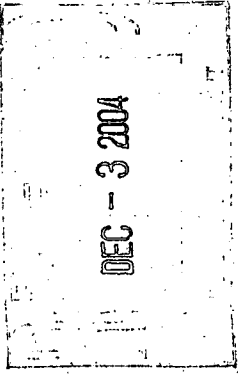




DLZ
Engineers • Architects • Scientists
Planners • Surveyors

DLZ Ohio, Inc.
6121 Huntley Road • Columbus, Ohio 43229-1003
Phone (614)888-4040 • Fax (614)848-6712
www.dlzcpr.com

MATERIAL DESCRIPTION	γ (pcf)	c' (psf)	ϕ' (deg)
1) COMPACTED COARSE REFUSE	123	0	35
2) LOOSE COARSE REFUSE	100	0	32



CRITICAL FAILURE SURFACE
F.S.=1.9
SEISMIC COEFFICIENT OF 0.05g
F.S.=1.5

CRITICAL FAILURE SURFACE
F.S.=1.8
SEISMIC COEFFICIENT OF 0.05g
F.S.=1.5

EL. 1140

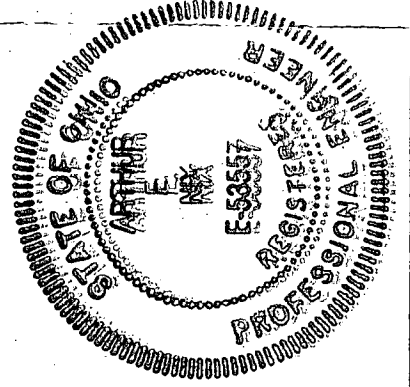
EL. 1130

POOL AND SLURRY

MAIN EMBANKMENT

PERKINS RUN
DISPOSAL REFUSE

ASSUMED PHREATIC SURFACE
EL. 1130
(WORST CASE)



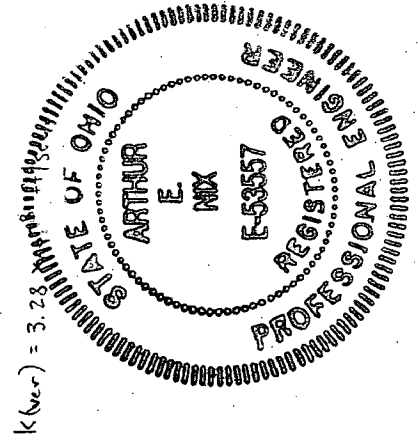
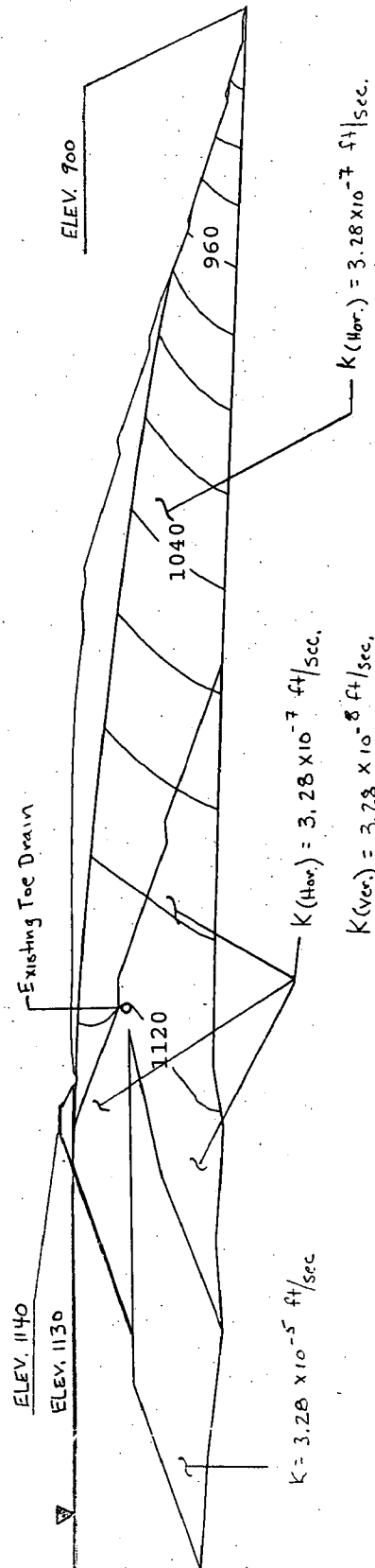
OPERATOR

THE OHIO VALLEY COAL COMPANY
SLURRY DAM NO. 2
EMBANKMENT RAISING



PAGE NO.	1
SCALE	1"=30'
DATE	3/28/04
APPROVED	ADN

Ohio Valley Coal - Dam No. 2
 Total Flowrate = 0.576 ft³/day/LF



(1 inch = 250.00)

W:\proj\0221\3002.00\Gut500p\dam-gub-1.dwg

CLIENT Ohio Valley Coal
PROJECT OVCC No. 2
SUBJECT Seepage Estimate

PROJECT NO. 0321-3002.00
SHEET NO. 1 OF
COMP. BY PAN DATE 4/28/04
CHECKED BY DATE

SEEPAGE RATE

Total Flowrate from seepage analysis = $0.576 \text{ ft}^3/\text{day}/\text{LF}$

$$\frac{0.576 \text{ ft}^3}{\text{day}} \times \frac{7.48 \text{ gal}}{1 \text{ ft}^3} \times \frac{1 \text{ day}}{24 \text{ hr}} \times \frac{1 \text{ hr}}{60 \text{ min}} = 0.003 \text{ gpm}/\text{LF}$$

For seepage estimate assume dam length is 2000'

$$Q = 0.003 \times 2000 = 6 \text{ gpm}$$